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UNIVERSITY OF SOUTHAMPTON

**FACULTY OF ENGINEERING AND THE
ENVIRONMENT**

**ENVIRONMENTAL COMPLIANCE IN
SMEs**

An investigation into the legal performance of small and medium-sized enterprises (SMEs), encompassing compliance levels, the impact and effectiveness of environmental legislation and improving SME environmental compliance control systems

by

Christopher D.H Wilson

Thesis for the degree of Doctor of Philosophy

September 2011

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Abstract

There has been a great deal written about the difficulties faced by small and medium-sized enterprises (SMEs) compared to larger businesses. SMEs face difficulties complying with environmental legislation, particularly because of the amount of complex law. This can result in the 'environment' being treated as less of a priority even though SMEs collectively have a significant environmental impact.

Over the past few years, the UK has been focused towards achieving 'better regulation'. In particular, Hampton highlighted the need for more strategic thinking when it comes to developing regulation. Hampton suggested that regulators should use a risk-based model similar to that used by the England and Wales Environment Agency (EA). This view is shared by Local Authorities and other environmental regulators; however, there has been criticism from some commentators who suggest that certain legislation is not successfully enforced.

The increased use of risk assessment by the EA has reduced the number of inspections resulting in more 'pressure' being put on remaining inspections as well as there being less opportunity to identify non-compliance. In addition, those businesses not included under direct regulatory regimes are unlikely to be audited for compliance against any environmental legislation; consequently a significant portion of all businesses go un-inspected and uncontrolled. Because of the number of SMEs, there needs to be an effective system of regulation that controls activities and targets those businesses that pose a risk to the environment, without unnecessarily over-burdening SMEs. It is clear from the coalition Government's planned austerity measures in 2011 that management of the environment will have to be done with less resource than before.

This thesis draws together findings from research conducted between 2005-2011. Previous research on compliance with legislation has often been conducted in isolation with little research comparing compliance across a range of legislation, and certainly not using triangulation methods to assess SMEs' overall legal performance.

This study aimed to investigate the legal performance of UK SMEs with a range of environmental legislation. This study identifies:

- the level of compliance ('spirit' and 'letter' of the law) with environmental legislation;
- the impact and effectiveness of environmental legislation; and
- ways of improving the environmental compliance control systems for SMEs.

The study incorporated a wide range of environmental legislation, including that covering: waste management/ transfer, environmental permitting (including waste exemptions), site waste management plans, WEEE, RoHS, packaging, oil storage as well as identifying other potential environmental offences.

Detailed compliance audits were conducted with 44 SMEs from 5 different sectors from the north-west of England. Interviews with SME management, site staff, regulators, Government policy officials and support organisations; in total 99 individuals were interviewed.

The study indicates: -

- Low levels of compliance with the 'letter' and 'spirit' of the law.
- Knowledge and understanding of environmental legislation was poor; no single SME, regulator or support organisation appreciated 'environmental compliance' as a whole.
- Enforcement activity and surveillance of the SMEs audited was very low; this reflected nation enforcement figures.
- The impact of environmental legislation on SMEs is overstated. The impact increased commensurate with 'effort to comply' and 'enforcement action'.
- There was evidence of direct and indirect environmental harm as a result of non-compliance.

- Regulation can only be effective if it is complied with; measuring the link between the legislation and environmental protection must be accompanied by a clear understanding of compliance levels.

This study produces an initial assessment methodology for SMEs, compliance performance indicators and recommendations to improve SME compliance controls.

Key Words: Compliance, environment, enforcement, environmental legislation, SMEs

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Declaration of Authorship

I Christopher Wilson declare that the thesis entitled: 'Environmental Compliance in SMEs' and the work presented in the thesis are both my own, and have been generated by me as the result of my own original research. I confirm that:

- this work was done wholly or mainly while in candidature for a research degree at this University;
- where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
- where I have consulted the published work of others, this is always clearly attributed;
- where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
- I have acknowledged all main sources of help;
- where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
- parts of this work have been published in journals and/ or presented in conference proceedings prior to submission; details are provided where this applies.

Signed: *Christopher Wilson*

Date: September 2011

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CHAPTER 1

INTRODUCTION

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1.1 Introduction and Rationale

"The Environment Agency only directly regulates a small proportion of the businesses in the UK. Our key challenge now is to reach all businesses and change environmental behaviour throughout the supply chain. We want to see better use of resources and businesses make environmentally responsible choices about the other operators they use." (Young, 2004).

This quote from the then Chief Executive of the Environment Agency (EA) epitomises many aspects of this research. It highlights the lack of direct regulation for the majority of businesses and it recognises the need to reach all businesses because of their potentially significant environmental impacts.

The main purpose of environmental legislation is to protect the environment and humans from harm. The amount of environmental legislation has grown significantly since the first Alkali Act in 1863; this growth continued to accelerate in the 20th Century, particularly since the introduction of the Environmental Protection Act (EPA), 1990. UK legislation has evolved from a 'knee-jerk' reactive approach into an integrated permitting system for the heaviest polluters. The 'environment' is now recognised as being a particularly heavily regulated area of business; with this in particular being a significant problem for SMEs (Ehmann, 2007). There is over 80,000 pages of European legislation (Williamson *et al.*, 2006), over 500 relevant EU Directives (Ebbage, 2009) and in the years since 1997, more environmental legislation has gone through the UK parliament than any other area of law, except that covering finance and justice (Ends, 2008).

The regulation of industry has resulted in significant improvements in the quality of our environment; the EA (2006) report that:

- Since 1990, sulphur dioxide and nitrogen oxides emissions to air have fallen by 75% and 52% respectively;
- Water pollution (measured by biochemical oxygen demand) has fallen by 65% in the five years to 2001; and
- Environmental incidents have fallen by 30% between 1997 and 2000.

The EA as the principal regulator of the environment in England and Wales is responsible for more than 2,900 industrial activities (EA, 2010), more than 100,000 consents to discharge to inland waterways (EA, 2006), approximately 7,974 waste management licences (now termed environmental permits) (EA, 2009) and over 12,000 smaller exempt facilities (EA, 2006). In addition, it manages 49,000 water abstraction licences ranging from those for water companies to individuals (EA, 2007). It regulates directly through standard and bespoke permits and registrations, as well as indirectly through regulations, taxes and trading schemes, voluntary agreements, education and advice. It is clear that compliance with, and enforcement of environmental legislation is viewed as paramount to how successfully the environment can be protected (assuming that compliance can be linked to environmental protection).

However, there are concerns that this regulatory approach is not working as effectively as possible. The House of Commons (2005) reported that the EA did not have the capacity to regulate effectively, given the increasing demands placed on it. The Chartered Institution of Wastes Management (CIWM) told the committee that the EA *"needed more policemen...[and]...*

more money to police waste management" (The House of Commons, 2005). The Environmental Services Association (ESA) stated that *"the culture of enforcement"* was not strong enough, in part because of the EA's lack of resources. 'Beyond Waste' argued that the EA lacked the right skills to meet the challenges of the new hazardous waste regime. The Environmental Audit Committee has also suggested that the EA needs significantly more money just to combat fly-tipping (The House of Commons, 2005).

Nevertheless, Hampton (2005) and the then Better Regulation Commission in particular, have praised the EA's approach to compliance management due to their use of a risk-based model. This approach is also advocated by the Waste Strategy for England (Defra, 2007). A risk-based approach was heavily recommended by Hampton and resulted in legal compliance and 'better regulation' becoming the focus of a considerable amount of recent Government initiatives.

The EA regulates those businesses that fall under The Environmental Permitting (England and Wales) Regulations (2010) (as amended) (replacing 2007 regulations of the same name) (formerly known as Waste Management Licensing and Pollution Prevention and Control) using its Operational risk appraisal ('Opra') scheme (this is termed *"modern regulation"* by the EA [2007] and its aim is to drive environmental improvement). However, its compliance assessments do not specifically take into account any other legislation except those conditions covered in the environmental permits. Compliance with non-permitting legislation does not directly affect a facility's compliance rating under Opra (unless enforcement action is taken), moreover, inspections often only consider a sample of the aforementioned conditions. Therefore, there are **SIGNIFICANT** regulations which aren't audited under the EA's current system. In addition, those businesses not included in any permitting regime - the majority of which are SMEs - are unlikely to be audited for compliance against **ANY** environmental legislation and thus a significant portion go uninspected (Gunningham, 2002).

As a consequence, 'directly' regulated/ inspected businesses represent a very small proportion of UK businesses and furthermore, according to Bell and McGillivray (2006), inspections are falling; 50% in industrial sites and 30% on waste sites between 1997 and 2003. In fact, regulated and inspected businesses represent a very small proportion of the total UK business community (approximately one quarter of a percent of English and Welsh businesses are regulated by the EA).

Local Authorities and other regulators (such as Trading Standards) also have enforcement responsibilities under the EPA and other associated legislation. These typically cover 'less-hazardous' activities; however, Rogers (2007) indicated that local authorities lacked the resources needed to actively enforce the regulations, resulting in them only being able to respond to complaints. As a consequence, the legal compliance and environmental performance of most SMEs remains largely un-quantified and uncontrolled.

SMEs and compliance

This study principally investigated SME compliance with environmental legislation. It is extremely difficult to consider SMEs as a homogenous group due to their diverse sizes and business functions (Hillary, 2000). Although SMEs include those businesses employing <250 members of staff, having a turnover of <€50 million and/ or an annual balance sheet of <€43 million (European Commission, 2006), this research primarily focuses on micro (<10 staff), and small (<50 staff) SMEs from specific business sectors.

SMEs are an essential part of the UK business community, particularly as they account for 99.7% of the 4.7m UK businesses, 47.5% of turnover and generate 48.7% of turnover (Richard, 2008). Despite their individual small scale they have a huge collective impact on the environment (Hillary, 2000, Gunningham, 2002, Hutter, 1997 and the EA, 2008). SMEs account for approximately 60% of commercial waste arisings, 60% of carbon dioxide emissions and a significant proportion of pollution incidences (Fairman and Yapp, 2005 explain that size is not an indicator of risk). However, for a range of reasons, large firms in the UK have traditionally had disproportionately more influence than is warranted by their importance to the economy (Hillary, 2000). In recognising SMEs' collective importance, Fay (2000) identified the problems that SMEs have in dealing with the many issues that affect them. This means that environmental issues can be neglected for other more immediate business concerns, such as profitability, competitiveness and staffing. This opinion is supported by Atkins (2007) and Taylor/You Gov (2007) who reported that SMEs as a whole have extremely low levels of general environmental awareness as well as low awareness of the legislation specific to their business. Although they are expected to comply with the same laws as larger organisations, SMEs are more limited in the resources they can set aside to ensure legal compliance. Very little has been published on actual environmental compliance levels, particularly due to the difficulties determining compliance, with the EA's prosecution and enforcement action not truly reflecting compliance levels.

Because of the sheer number of SMEs, **there needs to be an effective system of regulation which controls activities and targets those operators that pose a high risk to the environment.** It is anticipated that a detailed understanding of the legal performance of SMEs will help to:

- Evaluate compliance on an individual and collective level;
- Identify, assess and explain the impact and effectiveness of environmental legislation on SMEs; and
- Suggest improvements to the current environmental compliance control systems for SMEs through the development of a number of recommendations (see aims and objectives).

1.2 Background

The study developed from initial work conducted by the Centre for Waste Management (CWM) at the University of Central Lancashire in the north-west of England. It was part of a two-year European Regional Development Funded (ERDF) project designed to improve SME environmental management. Environmental reviews were conducted in SMEs from a range of sectors. Environmental compliance was a key facet of the work and therefore initial compliance data was compiled. The project formulated a more prescribed assessment methodology that has been used by this study (see Chapter 3 and section 4.2.2).

SMEs were targeted from industry sectors thought to have a potentially significant environmental impact but likely to fall 'under the radar' of frequent regulator inspections - specific industry types and locations have been detailed in Chapter 3. Research was also conducted in directly-regulated SMEs from the waste management industry for comparison, enabling the current system for regulation of environmental legislation (The Environmental Permitting [England and Wales] Regulations and 'other' environmental legislation) on permitted sites to be evaluated.

This study was not intended to be an evaluation of the role of different environmental regulators nor was it designed to comment specifically on the need for more or less regulation, although there will be occasions when the reason for non-compliance may be indirectly attributed to these factors.

It was too large a task to address all the direct and indirect environmental legislation on the statute book. Therefore, this study concentrated on land, air and water legislation that was most applicable to the business community. This research does not include legislation specifically relating to planning, habitat, conservation or environmental health.

1.3 Originality

The research is original because:

- It provides up to date environmental compliance data for SMEs.

Much of the focus regarding environmental compliance concentrates on the policy issues associated with the role of the regulators; with the general consensus being that businesses are over-regulated and in many cases inspected unnecessarily. Despite empirical and anecdotal evidence showing that knowledge and awareness of legislation is poor, very little research showing compliance with particularly legislation (statute and statutory) has been conducted.

- It develops a sophisticated and intuitive methodology for the conducting of environmental compliance audits.

Although, 'auditing' is a well-documented and established process, there is currently little or no literature detailing specific techniques for the assessment of compliance with any environmental legislation.

- It investigates the link between environmental compliance and environmental protection.

There is little published literature investigating the link between compliance and environmental protection (and vice versa). This is fundamental to the process of compliance and enforcement, with this study seeking to provide examples where legislation does and does not meet this essential test.

- It evaluates how 'directly-regulated' SMEs comply with 'non-permitted' environmental legislation.

Although, some research has been conducted on permitted facilities, there is no thorough evaluation of the strength of the link between the EA Opra/ Compliance Assessment Report (CAR) system and the control of 'other' environmental legislation.

- It produces a number of key outputs designed to improve the environmental compliance control systems for SMEs.

This includes the provision of an initial assessment methodology for SMEs not directly controlled by EA or local authority permitting. It also develops compliance performance indicators that can be used by SMEs and/ or regulators.

- It provides insight into the link between compliance with environmental legislation and the level of regulatory inspections.

Some research has been conducted in this field, however, as yet there is little conclusive evidence of the link between compliance and regulatory inspections.

1.4 Thesis Structure

Chapter 1 introduces the subject and provides background information on environmental compliance and SMEs. The rationale and originality for the study are also set out as well as a clear statement of the aims and objectives.

Chapter 2 includes a comprehensive review of relevant literature. The review has been broken down into a number of sections for clarity and covers the key literature on regulatory policy, compliance and enforcement within SMEs, the impact and effectiveness of environmental legislation and environmental compliance control systems for SMEs.

Chapter 3 sets out the methodological approaches used in order to achieve the research aims and objectives. The fulfillment of each aim and objective is discussed individually as well as giving a description of the research limitations, piloting and the 'research environment' considerations.

Chapter 4 sets out the study's results and discussion. The results have been broken into 9 separate papers; note that these have been edited from previously published papers, all of which have appeared in peer-reviewed publications, conference proceedings or are *in-progress*.

Chapter 5 summaries the study's key discussion points from the published papers in Chapter 4 and aligns them with the aims and objectives.

Chapter 6 sets out the study's conclusions and recommendations.

The remaining sections consist of appendices and a glossary of terms. Due to the results in Chapter 4 being presented as individual papers with their own reference list, each previous chapter has been given its own reference list.

1.5 Aims and Objectives

Aim 1 - To determine and evaluate the level of compliance with environmental legislation in SMEs.

Objectives

- To conduct environmental compliance audits with individual SMEs; investigating in particular, how they comply with the 'letter' and the 'spirit' of the law.
- To determine SMEs' awareness and perception of environmental compliance.

Aim 2 - To evaluate the impact and effectiveness of environmental legislation in SMEs.

Objectives

- To analyse, compare and contrast the implementation of environmental legislation, based on SME, regulator and policy maker experience.
- To analyse, compare and contrast the enforcement action as a result of non-compliance, based on SME, regulator and policy maker experience.
- To determine if environmental compliance results in improved environmental protection and vice versa.

Aim 3 - To evaluate and improve the environmental compliance control systems for SMEs.

Objectives

- To determine the strength of the link between the Environment Agency Compliance Assessment Report (CAR) system and the control of 'other' environmental legislation in licensed/ permitted sites¹.
- To develop an initial assessment methodology for SMEs not directly controlled by the Waste Management Licensing or Environmental Permitting regimes².
- To develop environmental compliance performance indicators (CPIs) for SMEs.

¹ This objective was achieved by completing audits in permitted sites. It involves an assessment of permit conditions as well as an assessment of their compliance with other legislation. This data was compared to un-permitted sites.

² This objective considered the current Local Authority SME inspection regime.

The 'letter of the law' was assessed by judging how the individual regulatory requirements were met. The 'spirit of the law' was assessed by judging how SMEs and individuals go about complying with the intentions of the legislation as well as assessing their effort to comply and meet/ exceed best practice.

The following definitions have been used in this study:

- The '**environment**' is defined as in Part 1(1) of the EPA (1990) as "*consisting of all, or any, of the following media, namely, the air, water and land; and the medium of air includes the air within buildings and the air within other natural or man-made structures above or below ground*".
- '**Pollution of the environment**' is defined in the EPA (1990) as "*... due to the release (into any environmental medium) from any process of substances which are capable of causing harm to man or any other living organisms supported by the environment*".
- '**Harm**' is defined in the EPA (1990) as "*harm to the health of living organisms or other interference with the ecological systems of which they form part and, in the case of man, includes offence caused to any of his senses or harm to his property; and "harmless" has a corresponding meaning*".

The EA's Compliance Classification System (CCS) and Common Incident Classification Scheme (CICS) have been used as a guide to 'rate' incidents within the above parameters.

In summary, this study is set within the context of the 'better regulation' agenda and investigates environmental compliance in SMEs. It provides meaningful compliance data (covering the letter and spirit of the law) from north-west of England based SMEs as well as providing an

established methodology that can be applied to other regions. It is hoped that the results from the evaluation of the impact and effectiveness of environmental legislation will help to improve environmental compliance control systems for SMEs. Key outputs from the research include the development of compliance performance indicators and an initial assessment methodology for SMEs not directly controlled by any permitting regime.

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CHAPTER 2

LITERATURE REVIEW

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2.1 Context

This review covers the following key literature on compliance with environmental legislation in SMEs, including:

- United Kingdom (UK) and European regulatory policy;
- The characteristics and operational features of SMEs, including the commercial and legal difficulties they face and the support schemes available;
- Compliance and enforcement with environmental legislation in directly and indirectly regulated SMEs;
- The impact and effectiveness of environmental legislation (including implementation, enforcement and the role of legislation in providing environmental protection); and
- Current and future environmental compliance control systems for SMEs (including the use of risk assessment, environmental management systems and auditing as control mechanisms).

NB. The review does not include an assessment of the impacts of all environmental legislation, nor does it cover an assessment of regulatory approaches or an evaluation of current SME support schemes, although evaluations have been included if appropriate.

2.2 Regulatory Policy

A significant portion of previous studies on environmental compliance in SMEs focuses on regulatory policy. Commentary has derived from two main perspectives: from Europe and from within the UK.

2.2.1 European context

Environmental regulation

The signing of the Treaty of Rome (1957) and the formation of the European Economic Community (EEC) was a significant event in European history. The UK initially resisted this process and it wasn't until 1973 that the UK joined the 'Common Market'. The European Union (EU) as it is now known (as a result of the 1992 Maastricht Treaty and subsequent amendments by the 2007 Lisbon Treaty) built upon the principles of the EEC, with it being described as a political and economic union of its 27 Member States.

The EU has developed a single market through a standardised system of laws which apply in all Member States. It maintains common policies covering agriculture, fisheries and regional development. The first European environmental policy was launched in 1972 and since then it has addressed issues such as acid rain, ozone depletion, air quality, noise, waste and water pollution. The EU has great influence in terms of environmental regulation, with approximately half of UK laws being derived directly from European legislation (Davidson, 2006). As a result, the way in which legislation is implemented is of great significance for UK businesses.

The desire to simplify regulation has been expressed both at European level and within individual Member States since 1985 (Mandelkern, 2001), as a prerequisite for the achievement of the EU-wide single market. However, it is only since the middle of the 1990's that the concept of better quality regulation has come to the fore and a series of initiatives directed towards

improving the quality of regulation were adopted at both national and European levels. In particular, a protocol annexed to the Treaty of Amsterdam (1995) was adopted, setting out the principles of good regulation to be respected at European level.

It gradually became apparent that action coordinated between the European and national levels was necessary in order to improve the 'regulatory chain' from conception to application. This was the approach taken by the Lisbon European Council (2000), which asked the Commission, the Council and the Member States, each in accordance with their respective powers: -

"To set out by 2001 a strategy for further co-ordinated action to simplify the regulatory environment, including the performance of public administration, at both national and Community level".

In implementing these conclusions, EU Member State Ministers approved a Resolution on improving the quality of regulation within the European Union. Following the terms of this Resolution, a high-level advisory group consisting of regulatory experts from the Member States and the Commission was charged with taking an active part in the preparation of the strategy demanded by the European Council in Lisbon (Mandelkern, 2001).

The Lisbon European Council (2000) recognised the importance of regulation in terms of securing the prosperity of the European community and importantly it recognised the role of 'better regulation'- *"...it is not about unthinking removal of such regulation. Rather, it is about ensuring that regulation is only used when appropriate and about ensuring that the regulation that is used is high quality"* (Mandelkern, 2001).

The Lisbon Strategy was re-launched in 2005, making 'growth' and 'jobs' priority as well as moving better regulation up the political agenda. The revised strategy is no longer based on the targets set in 2000 but concentrates on five objectives: employment; human capital; research and development; the internal market for services; and reduction of the administrative burden (the latter being the most significant in terms of better regulation).

The Thematic Strategy on Waste (European Commission, 2006) focused on overlaps between the permit procedures set up in the Waste Framework Directive (Directive 06/12/EC) and the Integrated Pollution Prevention and Control Directive (Directive 96/61EC) as well as the possibility of merging other Directives. A further better regulation measure suggested by the European Commission (2003) included replacing Directives with Regulations, however, this is controversial, because even though it will simplify things (due to Regulations being directly applicable to Member States) it does not necessarily produce greater protection for the environment as well as being insensitive to the individual needs of each administration.

The initial (EU) meaning of 'better regulation' seemed to embrace the wider concept of more coherent, efficient and effective regulation; much more than just cheaper or less regulation. For instance, the EU Commission has reiterated the importance of embracing better regulation at the national level - it explained that better regulation, and in particular simplification, should not prevent Member States from setting more ambitious environmental commitments/ targets where permitted, or from using the flexibility allowed in EU Directives (European Commission, 2003 and Better Regulation Task Force - BRTF, 2004). However, these wider concepts have become obscured since the revision of the Lisbon Strategy in 2005 which focused on creating more jobs and economic growth (IEEP, 2005).

If better regulation makes Europe a more attractive place to invest and work then this presupposes that regulation *per se* has a negative impact on economic growth and jobs. However, research by the European Environmental Protection Agencies (EEPA, 2005) has shown that this is not necessarily the case. The 'Prague Statement' (EEPA, 2005) stated that good environmental regulation increases competitiveness. That said, not all environmental measures can contribute to growth and jobs, and some measures to protect the environment and human health do increase short-term costs to business.

The change in focus to one of 'de-regulation' seems to have passed onto various Member States. The UK in particular now seems to interpret better regulation in this way, with some feeling (Ends, 2006) that it is being used as a 'cloak' for those seeking to reduce social and environmental protection measures.

It is clear that Europe has a key role to play in terms of the direction of UK legislation. A key facet of this is how specific Member States implement the various EU Directives, Regulations and Decisions imposed.

Implementation of legislation

Various literature and discussion forums at European level have addressed this issue. The Thematic Strategy on Waste reported that waste legislation is not implemented well and is inconsistent between nations (European Commission, 2006). The strategy also explained that the interpretation of legislation has been the cause of much litigation, resulting in regulatory overlap and uncertainty for regulatory authorities. In contrast, the National Audit Office (NAO) (2005) suggested that the UK has a good record in terms of implementation of EU law compared to many Member States. In 2004, the UK was one of only five countries to meet the European Council's target of 1.5% or less of all Directives for which transposition is still outstanding. In contrast, from a general perspective, the European Commission in its 26th Annual Report on the application of Community law has found that environmental laws are amongst the most regularly flouted (this is supported by Jackson, 2011). Implementation in the areas of waste, water, industrial installations and air legislation seems particularly problematic (The Environmentalist, 2010).

In order to implement the EU's waste policies and reduce the negative environmental impacts of waste, the Thematic Strategy proposed to modernise the current EU legal framework by simplifying and joining existing Directives as well as introducing more thorough use of life cycle analysis.

The UK Davidson Review (2006) focused on 'over-implementation' of EU legislation and on issues such as 'gold plating', 'double-banking' and 'regulatory-creep'. The review reported how the Government recognised that the stock of existing UK legislation derived from the EU may include examples of legislation that has not been brought into effect in the least burdensome way. A significant amount of the allegations of over-implementation were leveled at environmental legislation, although most were staunchly defended by Defra and the EA.

The Davidson Review is part of the Government's drive to reduce unnecessary regulatory burdens on the private, public and voluntary sectors and contributes to the regulatory reform agenda. Following recommendations from the BRTF (2005) the Government has undertaken rolling programmes of simplification in terms of regulatory burden (as suggested by Hampton, 2005) (see UK Policy section below).

Hampton reported that it is too simplistic and misconceived to just compare the number of words set out in Directives and those set out in national legislation as more information is not necessarily evidence of less or more burden for the regulated. Differences in legal systems, devolution and pre-existing domestic legislation across Member States also means that the amount of national legislation needed to meet European obligations will vary across Member States. Given the very large amount of EU-sourced legislation in the UK, it is not possible from examining a limited number of case studies to draw definitive conclusions on the extent to which the UK may inappropriately over-implement European legislation.

A number of factors indicate that inappropriate over-implementation may not be as big a problem in the UK – in absolute terms and relative to other EU countries – as has been alleged:

- Many allegations are misplaced as they either relate to concerns about the EU measure itself or wrongly assume that certain UK legislation originated from the EU;
- It can sometimes be beneficial to set or maintain regulatory standards which exceed the minimum requirements of European legislation; and
- Evidence to support the assertions is often lacking - the UK is regarded by some as a leader in this field, with the OECD and World Bank 2007 consistently reporting that the UK has one of the most favourable regulatory environments for doing business in the EU (Davidson, 2006).

SME support schemes

With some estimates showing that up to 80% of national legislation derives from EU Directives and Regulations, there is a clear argument that EU policy should focus on helping SMEs to comply. Williamson *et al.*, (2006) argue that a support mechanism is needed for SMEs to address the compliance needs on a European-wide basis.

In recognition of the threat of pollution from SMEs and the difficulties they face in terms of environmental compliance, the European Commission established an Environmental Compliance Assistance Programme (ECAP) to support SMEs with compliance and to improve environmental performances. Action is being taken in a number of areas:

- Minimising the administrative burden on companies;
- Helping SMEs integrate environmental concerns into their businesses;
- Support regional and national networks;
- Build up local know-how; and
- Improve communication (European Commission, 2007).

This need for SME support from an environmental point of view is supported by Monkhouse *et al.*, (2006) who state that:

“SMEs are an important engine for economic growth and employment throughout the European Union. However, SMEs are also an important contributor to environmental pollution (Informal meeting of EU Environment Ministers, Amsterdam, April 1997).

The European Commission (2007) also refers to research commissioned by Netregs and the Institute of Directors (IoD) showing SMEs' lack of awareness of environmental regulation and lack of capacity to deal with environmental impacts. These concerns have led to the development of the aforementioned SME ECAP.

In fact, the EC reported that over the past few years, it has supported a series of initiatives to help SMEs tackle their environmental problems, particularly through EMS, eco-labeling, clean technologies and financial support. It also reported that a large number of initiatives are already in place at national level to help SMEs comply with legislative requirements and improve their environmental performance (Monkhouse *et al.*, 2006 and Richard, 2008). In contrast to the European Commission (2007) and Monkhouse *et al.*, (2006), the UK based Richard Review was much more critical of the current SME support schemes, even though the aforementioned documents did imply through their recommendations that more tailored and targeted support was needed.

The main EC policy issues were organised in four main clusters:

1. Co-ordination of compliance initiatives by Member States;
2. Increasing the effectiveness of existing policy measures for SMEs;
3. Increasing communication and awareness raising; and
4. Improving financial support for sustainable production in SMEs.

Some key areas seem to have been excluded from the policy issues, for instance, although regular inspections by enforcement authorities are seen as a necessary tool, they are not recognised as sufficient. In addition, the promotion of action by Member States by setting targets for compliance, or ordering more inspections of SMEs were not seen as meeting the objectives and were not included in the programme.

Further action from Europe to acknowledge the importance of SMEs to the European economy was taken in 2008 with the introduction of the Small Business Act. Although not legislation, it contains a set of principles to guide the implementation of national and EU policy-making so as to create fairness and consistency for the operation of SMEs throughout Europe. Under these principles, prospective legislative and administrative burdens on SMEs must first address the 'think small first principle' and consider the impacts on SMEs.

The principles also promise greater availability of finance and access to state aid for SMEs and also include supporting SMEs to turn environmental challenges into opportunities.

Overall, it is clear that there are already a large number of specific SME support schemes and a great amount of work is being done across Europe by the Member States to try and work with SMEs. However, there seems to be a lack of consistency in the approaches as well as a lack of agreement about how successful they have been.

2.2.2 UK Context

Environmental regulation

The policy direction for UK Government better regulation policy is encompassed within 3 key reports - the Hampton Review (2005), the Macrory Review (2006) and the Rogers' Review (2007). Despite these reports, 'better regulation' in the UK can be dated back to a 1985 White Paper - 'Lifting the Burdens' and more recently to the establishment of the BRTF (in 1997) who in 2005 estimated the total cost of regulation to the UK economy at 10-12% of GDP, or £100 billion (BRTF, 2005).

The framework for action in the UK now includes regulatory principles, regulatory impact assessments, simplification plans, and post-implementation reviews (BRTF, 2005). The BRTF was replaced by the Better Regulation Commission (BRC) in 2006 with the Government seemingly committed to implementing its recommendations. The BRTF established the 5 core principles of regulation ('proportionate', 'accountable', 'consistent', 'transparent' and 'targeted') that still exist today. In 1999, the Government established the Regulatory Impact Unit in the Cabinet Office, which among other things established the need for a Regulatory Impact Assessment (RIA) of new legislation at the policy stage. De-regulating legislation was also introduced - the Regulatory Reform Act 2001 (which was subsequently replaced by the Legislative and Regulatory Reform Act 2006) and in 2004, the Government asked Philip Hampton to consider the scope for reducing administrative burdens by promoting more efficient approaches to regulatory inspection and enforcement.

Hampton (2005) identified ways in which the administrative burden of regulation on businesses can be reduced whilst maintaining or improving regulatory outcomes. The review sets out a number of areas of good and innovative practice. However, it reported that as a whole, the system is uncoordinated and inconsistent with overlaps in regulators' responsibilities and enforcement activities.

Hampton praised the use of risk assessment as a means of directing regulator resources and criticises where it is not used. The report praises the EA's Operation and Pollution Risk Appraisal ('OPRA') scheme (referred to as Operational Risk Appraisal ['Opra'] from 2008) although it did not seem to investigate the efficiency of the risk assessment process; just that one was in use. The author of the review believes that by eliminating unnecessary inspection, more resources could be directed to providing advice (although this does not take into account the quality of advice likely to be given); however, it does state that 50% of small businesses that try to find advice on regulation are unsuccessful in locating it.

Hampton explained that regulatory penalties do not take the economic value of a breach into consideration and it is quite often in a business's interest to pay the fine rather than comply. The review felt that this problem was partly down to the regulatory structure in the UK. At the time, inspections and enforcement was divided between 63 national regulators, 203 trading standards offices and 408 environmental health offices in 468 local authorities. Hampton reported that regulatory responsibility is not proportional across the country, although the environmental sector is probably lucky because the EA deal with most land, air and water issues whereas 20 different inspectorates regulate farms.

Other recommendations from the review include the use of comprehensive risk assessment for all regulators so that inspections are only conducted where there is a risk; resources released from unnecessary inspections should be redirected towards advice to improve compliance. The review also recommends the use of fewer, simpler forms, explaining that there should be a coordination of form design across regulators and as many as thirty-one national regulators should be reduced to seven thematic bodies.

There are a number of key issues deriving out of these recommendations, some of which have been considered in further sections of this review with others being considered in subsequent chapters. The most salient point to recognise is the influence that this review has had on UK regulation and enforcement policy in terms of the significant reduction in regulatory inspections (as supported by Bell and McGillivray, 2006) and resulted in an almost veto of the role of regulatory inspection (the view that better regulation has become de-regulation is supported by

Ends, 2006). The key issue here is whether sufficient risk assessment has actually taken place; only a small number of businesses are currently inspected (see section 2.6 on 'risk assessment') and there is not a full understanding of the impact that inspections have on compliance (i.e. recognising the difference between the impact of an inspection increase and an inspection decrease) (see section 2.5 on the 'impact of regulation').

The Hampton review is complemented by the Macrory Review (2006); this focused on how compliance could be improved amongst UK businesses. The review looked at the main reasons businesses were not compliant and what could be done to address the situation. The review explains that most UK businesses comply with all regulations - previous research into environmental compliance has shown that this is not the case (Wilson and Williams, 2008, Fairman and Yapp, 2005 and Bland *et al.*, 2004).

The Macrory report made nine recommendations, aiming to ensure regulators had a set of modern and flexible sanctions that were proportionate and appropriate to the risks faced:

- that the Government review the drafting and formulation of any criminal offences relating to regulatory non-compliance;
- the design of sanctions in line with the penalty principles and characteristics outlined in the review;
- giving criminal courts new powers to punish regulatory offences;
- introducing new financial penalties as an intermediate sanction;
- improving the system of statutory notices;
- introducing a new type of sanction, including enforceable undertakings;
- considering pilot schemes to gain restorative justice for regulatory non-compliance;
- making available alternative sentencing options in criminal courts; and
- introducing new measures to improve transparency and accountability, including: a working group of regulators to share best practice and enforcement activities on a regular basis.

The Government accepted the report's recommendations in full, some of which have been taken forward by the Regulatory Enforcement and Sanctions Act 2008 (see *legislation* section below). These include fixed monetary penalties, discretionary notices and cessation notices and enforcement undertakings.

Since 2005, the government has tried to implement the main recommendations made by Hampton and better regulation has become a key government objective with the then Department of Trade and Industry (DTI) having been set a target to reduce the regulatory administrative burden on UK industry by 25% by 2010. Moreover, the 'better regulation' agenda has led to the adoption of regulatory roles within Government departments (The Department of Business Enterprise and Regulatory Review [BERR], now incorporated within The Department of Business Innovation and Skills [BIS]), executives (Better Regulation Executive - under the auspices of BERR), councils (Risk and Regulatory Advisory Council [the members of which have derived from the former Better Regulation Commission]) and panels (Panel for Regulatory Accountability) each tasked with improving and/ or scrutinising how risk is assessed and managed.

All UK Government regulators have been tasked with implementing the recommendations from Hampton (2005) and Macrory (2006). However, Ends (2008) reported that the then Department of Business Enterprise and Regulatory Reform (BERR) criticised the EA, stating that its approach to regulation is "*not yet embedded throughout its culture*". A key criticism was that the

number of inspections are high compared with other regulators as well as there being no evidence that the EA has examined the effectiveness of inspections in achieving compliance. In addition, it criticised the requirement for site operators to report monitoring data to demonstrate compliance, especially when EA staff do not have time to interrogate the monitoring data submitted. The report also criticised the lack of competence and flexibility of inspectors, stating that many were inexperienced and unable to make risk-based decisions and that Environmental Protection Operator Pollution and Risk Appraisal ('EP OPRA' as it was then known) was not being used to its full potential in terms of varying charges for good performers.

Hampton's and Macrory's work is supplemented by Rogers (2007), who focused on local authority enforcement of 'less hazardous' activities. A key conclusion from his report was that local authorities lacked the resources needed to actively enforce regulations; resulting in them only being able to target certain high risk areas and respond to complaints. The lack of attention for 'low-risk' sites is also recognised by The Scottish and Northern Ireland Forum for Environmental Research (Sniffer) (2010).

Further concerns were reported by Ends (2008c) as it outlined BERR's plans to implement capping the total cost of new regulations across the economy. This would amount to regulatory budgets that would place an overall cost control on new regulations. This could mean high initial cost but long term benefit proposals being hampered. Environmental action groups have complained that it will help to constrain the growth of regulation and promote de-regulation.

The proposals would apply to UK measures and not to local government. Proposals would also in theory take into account the cost of compliance with EU regulation as much of this can't be controlled. It is also difficult to apply rigid costs to some legislation but BERR want a methodology for monetisation where possible. The EA were generally against the idea and the Institute for European Environmental Policy (EEP) said that the regulatory budgets approach was unworkable and would lead to unintended negative consequences.

As a result of an increasing 'risk-focused', prioritised and restricted resources agenda, there is a risk that the legal compliance and environmental performance of many SMEs will remain largely un-quantified and unmanaged.

SMEs

Despite their importance to the UK economy (see section 2.3) and that SME environmental performance is broadly reported (through the EA's Spotlight on Business report, 2008) there is little policy or strategy in terms of how to best target and manage the risk of SMEs breaching legislation and causing harm to the environment. Evidence of specific SME interventions show that much of the support tends to be passive or on a small scale with no clear strategy or vision in place (European Commission [produced by Ecotech Research and Consulting], 2000).

The aforementioned report also suggests that UK environmental legislation does not make a significant distinction between SMEs and larger enterprises. It also suggests that as in other Member States, it is doubtful whether the resources are in place to identify and respond to all enterprises causing pollution (as supported by the BRTF, 2004 and Rogers, 2007).

In spite of the above, research undertaken by the University of Manchester, funded by Sniffer, has attempted to set out a strategy for use by regulatory agencies to manage SME environmental compliance (Sniffer, 2008). Further details are set out in section 2.6.4).

Compliance

The EA - as the main regulator - has adopted a number of positions on regulation and compliance over recent years. As well as a documented enforcement policy (EA 2008b), it has set out its approach to regulation (EA, 2006). The 21st Century Approach to Regulation refers to the use of risk-based regulation (termed “*modern regulation*”) as a key part of its approach. This mentions SMEs in a number of occasions, for instance it refers to the advantage of using environmental taxes, educational schemes and EMS implementation schemes such as ACORN to reach out to those SMEs not regulated directly. Although these approaches are relevant, they do not go far enough to constitute a strategy for the management of SME compliance (as supported by Sniffer, 2008). A strategy is needed due to the identification that small firms, even though they ‘have a small individual impact, collectively it is significant’ (as supported by Gunningham, 2002, Hillary, 2000 and significantly the EA, 2008). Lastly, the approach stated that businesses have to earn the right to lower levels of regulatory attention - this statement in itself is fine, but the key factor is how this is determined; a problem exacerbated by diminishing inspections which could be used to determine such levels of management.

Sector plans have also been developed (EA, 2006b) - the plans for the waste management industry identify fly tipping as a significant issue (in terms of illegal waste activity and environmental impact) and that more needs to be done to combat it. However, this does not seem to be complemented by plans to reduce the amount of regulatory activity as previously explained. This is further evidenced by the inclusion of waste crime and fly-tipping in the Waste Strategy 2007 (Defra, 2007) with particular emphasis being put on the need for a fly-tipping strategy (supported by the Jill Dando Institute of Crime Science).

Legislation

It is clear that new legislation is a major driver in terms of environmental management and there has certainly been a plethora of environmental regulation over the past 10 years in particular; since 1997, the introduction of environmental bills is second only to financial and criminal justice bills (Ends, 2008b).

There have been a number of recent developments that will change how environmental legislation is implemented and enforced in the UK. Key legislation includes the Serious Organised Crime and Police Act (2005), which replaces parts of the Police and Criminal Evidence Act (1984) and introduces a new body - the Serious Organised Crime Agency (SOCA). This merged with the Assets Recovery Agency that was formed under the Proceeds of Crime Act 2002. This allows for civil recovery of the proceeds of crime and removes the need for prosecuting solicitors to specify the type of crime where there was monetary or asset gain, leaving it that just a gain from crime has to be found. Other legislation of importance includes the Serious Crime Act (2007), which introduced ‘inchoate offences’ (amending the Serious Organised Crime and Police Act, 2005) which could in theory be applied to environmental crime.

The Regulatory Enforcement and Sanctions Act (2008) is also significant as it allows more consistent enforcement of regulations requiring regulators to follow key principles and is a key output from the Hampton Review. Among other things, the Act re-establishes the Local Better Regulation Office (LBRO) and introduces new civil penalties that regulatory authorities can impose on businesses.

Other key legislative areas include that introduced to combat fly-tipping - which resulted in measures introduced under the Anti-Social Behaviour Act (2003) and the Clean Neighbourhoods and Environment Act (2005) and later in the Waste Crime Consultation which suggests various amendments to the duty of care, waste carrier and broker regimes (Defra, 2008). In 2009, The Environmental Damage (Prevention and Remediation) Regulations (2009) were introduced, implementing the EU Environmental Liability Directive (2004/35/EC). The Directive's objective was to establish a framework of environmental liability based on the 'polluter pays' principle to prevent and remedy environmental damage. Under the regulations, operators of economic activities are required to prevent, limit and remediate significant environmental damage to protected species, natural habitats, sites of special scientific interest, surface water, ground water and land. Operators will be liable for any significant environmental damage or negligence where they are found to be at fault (excluding acts of terrorism, or resulting from the effects of exceptional natural phenomena).

Another key development following the Hampton Review was the establishment of a Statutory Code of Practice for Regulators (BERR, 2007) (designed to sit along side rather than replace the widely adopted Enforcement Concordat, which was established in 1998 [DTI, 1998]). The new code although similar, is broader than the Enforcement Concordat as it requires regulators to plan the way they regulate and inspect businesses in a way that causes least disruption to the economy. It requires regulators to consider the Code when determining policies, setting standards or giving guidance on duty.

It also asks regulators to consider the use of risk assessment, ensure that they provide information and advice in a way that enables businesses to clearly understand what is required and only perform inspections following a risk assessment, so resources are focused on those least likely to comply.

The above legislation highlights that a wide range of civil and criminal penalties can be applied to environmental offences and it is only a matter of time before these filter down to those causing environmental crime - there is already some anecdotal evidence to suggest that this is occurring.

2.3 Small and Medium-Sized Enterprises (SMEs)

There is a vast body of literature available on SMEs; the following section outlines the reasons why SMEs are regarded as a problem as well as highlighting some of the current SME support schemes available.

The SME conundrum

SMEs are vital to the UK economy; they account for 99.7% of businesses (totaling 4.7 million) (National Statistics, 2007), 47.5% of employment and generate 48.7% of turnover (Richard, 2008). However, they are not a homogenous group and care has to be taken applying conclusions from one sector to another or between 'micro' and 'medium' SMEs (Fairman and Yapp, 2005). They are defined as businesses employing <250 members of staff, having a turnover of <€50 million and/ or an annual balance sheet of <€43 million (European Commission, 2006b). Despite their individual small scale, SMEs can have a huge collective impact on the environment - unsubstantiated figures of 70% and 80% are suggested by Hillary

(2000), the EA (2007) and Williamson *et al.*, (2006). This is also supported by Fairman and Yapp (2005) (from a health and safety perspective) who state that size isn't an indicator of risk.

In recognising SMEs collective importance to the UK economy, Fay (2000) identified the problems that they have in dealing with issues such as profitability, competitiveness and staffing; resulting in environmental issues being neglected. This is supported by Fairman and Yapp (2005) who explain that SMEs find regulations difficult to implement; low cash flows result in strict control of staffing, meaning that SMEs may not have personnel available to monitor changing legal requirements, and interpret and implement the necessary controls. Time is also seen as a limiting factor in dealing with regulatory requirements, and within SMEs, responsibility for dealing with regulations often falls to the proprietor who may not have any specialist skills. Because of the sheer number of SMEs, there needs to be an effective system of regulation that controls activities and targets those industries and operators that pose a high risk to the environment.

There are a number of businesses/ organisations representing the interests of SMEs; these include, but are not limited to: The EA's Netregs, The Federation of Small Business (FSB), The Small Business Service (SBS), The Small Business Council (SBC) and a network of Business Links and Chamber of Commerce (see SME support schemes below). Despite this support, Ends (2007) reported that "SMEs [were] *still uninformed on environmental pitfalls*" - the report was based on a 2007 Netregs survey which showed that less than one in ten SMEs have heard of the EA's Netregs website, although it does report that SME's knowledge is improving. The survey also found that 15% of the 4,490 SMEs questioned realised that their activities were a potential threat. Once the respondents were given a list of potential harmful activities, the figure rose to 49%. Moreover, less than a quarter could name a piece of environmental legislation and only 15% had an EMS in place. This research is supported by Petts *et al.*, (1999) who explain that while the majority of SMEs are not deliberately non-compliant they are vulnerable to this state, particularly where there is a lack of awareness of, and empathy, with regulation. Petts *et al.*, (1999) explain that there is evidence of a perceived lack of clarity amongst SMEs of what actually constitutes non-compliance, and a mismatch between personal concerns about the state of the environment and the perceived role of legislation in achieving environmental protection.

Legislative knowledge and environmental activity were particularly poor among firms with less than 9 employees (as supported by Taylor/ YouGov, 2007 and Fairman and Yapp, 2005b). This lack of awareness is likely to be a symptom of a more general problem – that management of 'the environment' is treated as a "*residual*" role (Williamson *et al.*, 2006). This is supported by Baylis *et al.*, (1998) who stated that company size is a very important factor with larger companies, identifying 48% more stimuli to make environmental improvements. This helps to explain the greater level of environmental activity which large companies have undertaken and reported.

Tilley (2000) focused on the environmental ethics within SMEs - stating that ethics, among other things, is the critical examination of what is morally right and wrong. She explained that ethics in its broadest sense provides the basic conditions of acceptance for any activity. She explained that the predominant focus of the business ethics literature has been on the activities of larger organisations. Thompson and Smith (1991) suggest that this is because:

- Small firms are perceived as lacking sufficient resources;

- Research methodologies created for large companies are not readily adapted to small firms;
- More information is accessible to research large firms; and
- Large companies have a higher public profile that generates more interest in the theories and research about these organisations and their corporate social responsibility.

She explained that research is needed into the ethics of the small firm because these firms are significant to the economy (and the environment as suggested by Hillary, 2000, Gunningham, 2002 *inter alia*) but that crucially, “SMEs are not little big firms” and thus the theory generated for large firms cannot necessarily be applied to small firms.

Tilley questioned whether small firms are capable of self-regulating their environmental impact - her research explained that it was not well supported amongst participants. In general, SMEs recognised that they are not best placed to identify what actions they need to take in order to manage their environmental responsibilities - just because people are experts in their industry does not mean that they possess the requisite environmental expertise. Tilley explained that they have “low standards of eco-literacy” and importantly, one individual explained that small firms only respond when things are imposed on them because they cost! Tilley explained that small firms demonstrated a preference for external (prescriptive) regulation as opposed to self-regulation (as supported by Fairman and Yapp, 2005b). This contradicts other findings as many state that government imposed regulations are one of the biggest problems facing SMEs (as suggested in section 2.2).

In summary, Tilley’s research does not support the principle of self-regulation as the primary mechanism to govern SME environmental behaviour. If environmental ethics are to be administered by self-regulation, a higher degree of expertise and eco-literacy is required amongst SMEs.

SME support schemes

Management of SMEs pose a bit of a conundrum as it is recognised that they are important to the economy but have a high collective environmental impact. We need to be careful how to manage this impact as SMEs in particular can feel the burden of regulation. The necessity for support from regulatory officers is identified by Alexopoulou (2007) who thought that there should be more assistance, although did not commit to what support should be provided.

A report commissioned by the Conservative Government, Small Business Task Force reported the number of current Government SME support schemes to be an estimated 3,000 (administered by 2,000 organisations), equating to £2.5 billion of direct business support in 2003/4 (Richard, 2008). However, only 4.4% (as surveyed by the FSB) and 15% (as reported by the CBI) of SMEs are using these schemes. Moreover, only 0.5% of SMEs used these Government support schemes and were satisfied with them - a problem compounded by the sheer number of schemes (Richard, 2008). This is supported by Williamson *et al.*, (2006) and Pimenova and Van Der Vorst (2004) who reported that most firms had never sought help on environmental issues. Where support had been received, it was generally felt to be poor or to address one-off and isolated issues. Respondents thought support was too difficult to access, complicated, bureaucratic and generic. Yet most respondents thought their firms could improve their environmental performance and would benefit from appropriate support. The most

important need was clear information on regulations, closely followed by direct guidance and individual support (handholding).

Richard (2008) reported that despite the large number of support schemes and support organisations, small businesses are under-represented on working groups tasked with reviewing policies. Williamson *et al.*, (2006) agrees there is no evidence that small firms had developed long-term relationships with support providers. They usually employ specialists and have an increased ability to implement and monitor legal requirements, resulting in large businesses calling for self-assessment and self-regulatory approaches. SMEs often do not belong to a trade body that can represent their views; neither do they have the time to attend working groups in order to express their views on proposed policies (Fairman and Yapp, 2005).

To improve this situation, Richard reported that up to 2,900 schemes were set to be abolished by 2010 by the Labour Government (through the 'Support Simplification Programme' - also reported by Ehmann, 2007), however by 2008, just 10 of the 3,000 schemes had been scrapped, with BERR (as it was then known) instead seeking to rename schemes 'products' and group them under 'portfolios' in order to get close to the reduction target. This constant changing of support schemes is criticised by IoD members as Ehmann reported that SMEs want the Government to "*keep things constant, [and] stop changing the support at the end of every year*".

Richard also presented some other damning statistics, such as that only 34% of Government support schemes are evaluated in any way and 33.5p per pound (at best) of central Government spending is lost to administration. He suggested that "*Government's expenditure on business support is not having any measurable impact whatsoever*". This is down to a lack of any measurable macro-economic impact and although there is evidence of individual assistance, this is not robust enough to show effective expenditure. The report recommends the use of a single, web-based Business Information Service, rather than the regionalised business support apparatus of Regional Development Agencies (RDAs) and Business Links. The use of a web-based support tool is broadly supported by Williamson *et al.*, (2006); however, unlike Richard, the authors suggest that the impact and effectiveness of this would be strengthened if it was accompanied with individual support (i.e. hand-holding). Although Richard's review is not exclusive to environmental support, the use of web-based support contrasts with other research into SME support schemes which suggest need for more tailored support (Monkhouse *et al.*, 2006) with personal face-to-face contact being the most successful interaction method (Fairman and Yapp, 2005 and Howarth and Fredericks, 2011).

2.4 Compliance and Enforcement

Regardless of Government policy intentions, businesses need to comply with legislative requirements either through being proactive or through reacting to enforcement measures. This is supported by Adshead (2008) in the context of the UK being able to meet its waste strategy, despite the fact that regulation does place a burden on business.

The following section, discusses the definition of compliance, assessing actual compliance levels and assessing opinion on the enforcement of legislation.

2.4.1 Defining compliance

IMPEL suggest that compliance is defined as: *“full implementation of environmental requirements. Compliance occurs when requirements are met and desired changes are achieved”* (cited in IEMA, 2005; 25) (this is also supported by the European Co-operation for Accreditation, 2007 and the United Nations Environment Programme (UNEP) (1996).

Vivian (1999) explained that ‘compliance’ traditionally means meeting environmental legislation. He explained that the process of environmental compliance is a 2-phase process - beginning with an understanding of the requirements of the law (or ‘the what’) and secondly, putting into practice the improvements and sustaining them (or ‘the how’). He also explained that ‘comprehensive compliance’ is a level above this. Legal compliance with respect to the interface between the organisation and the environmental regulators can be understood as the situation when no reactive enforcement actions are made or can be expected by the organisation.

Non-compliance is defined by Remas (2006) as: *“a failure of a permit requirement or infringement of legal instrument or voluntary code to which a site subscribes”*. Although this initially seems to be the opposite of compliance, Fairman and Yapp (2005) and Hutter (1997) imply that the original definition of compliance is too simple and a more practical definition is, - *“that which is enforced by the regulatory authorities”*. This is then caveated by Hutter (1997) who explained that compliance has no one definition and that non-compliance has no one explanation.

The complicated nature of compliance is further emphasised by Hutter and Power (2000), who stated that compliance is a creative process involving negotiation and interaction between regulatory agencies and those they regulate – it is therefore a fluid concept that comprises a variety of dimensions. As a consequence, determining what is meant by compliance involves an assessment of the risks associated with any given activity and their acceptability. One of the difficulties of regulating industrial and commercial activity is finding a balance between the purpose of regulation and its cost.

A complication of this is that our understanding of risk changes as does the public, managerial and regulatory understanding and tolerance of risk (supported by the Safety Health Practitioner [SHP], 2009). As a consequence, compliance is emergent and businesses may be genuinely unsure what it is. Furthermore, companies and managers within them may differ greatly in their understanding of regulation. While small businesses are often confused about regulation, large companies use regulators as a source of information.

Vivian (1999) explained that the degree of compliance obtained by an organisation is a function of the level of control it exerts which in turn is based on the level of understanding of environmental issues and their impacts. He explained that the development of legislation has run in parallel with concerns in society and has given us a set of standards, which we can to a degree aim for and set objectives against. Importantly, he outlined that this legislation is an inevitable consequence of our inability to address the issues voluntarily.

Farmer and Skinner (2003) stated that the law making process is extremely difficult; it is probably better to implement a less than perfect law than not to implement any law at all. However, it is important to be aware that difficulties in EU environmental legislation can have a significant impact on environmental outcomes. If laws are deficient in certain areas then a range of problems can occur, such as the legislation not achieving its aims and difficulties in terms of

interpretation and application. This is supported by the Confederation of British Industry (CBI) (2004) who claimed that regulation is important for improving environmental standards, but that if it is poorly designed, it can hinder economic growth, especially as the amount of environmental regulation increases.

Fairman and Yapp (2005) outlined that most SMEs felt they were compliant until it was made known to them that they were not (6% compared to 45% in terms of food safety legislation). In other words, they viewed compliance reactively and not as a process in which they should be continually engaged. Where there were few interventions from regulators, SMEs believed they complied and that someone would let them know if they did not. Non-compliance was related to harm, and many SMEs could not conceive non-compliance with self assessment or risk assessment type requirements as these are proactive activities. Non-compliance was related to things they perceived that might be prosecutable. This has a knock on effect in terms of the compliance process and the interventions used by SMEs to improve compliance. This doesn't necessarily mean that SMEs are being untruthful; it just means that they felt it differently to the regulators who see it as meeting the legal requirements rather than the outcome of the regulatory encounter (Fairman and Yapp, 2005).

These observations are supported by the work of Alexopoulou (2007) in her interviews with regulatory officers. She reported that both the NI and SEPA staff recognised the standard definition of compliance, however, some took the view that whilst compliance was important, if the overall goal is environmental protection and improvement then compliance could or should integrate activities which help to achieve that goal. This suggests that compliance isn't always the ultimate goal for regulators and may also suggest that not all regulators feel that environmental legislation achieves environmental protection.

The EA's prosecution and enforcement action does not truly reflect compliance levels. This is because the meaning of compliance in terms of the 'actual' dictionary definition is very different to the 'non-compliances' prosecuted. The EA determines non-compliances based on what 'harm' has been caused (outcome focused) or is likely to be caused rather than prosecuting the actual non-compliance.

Williamson *et al.*, (2008) suggested the following definition of compliance: "*compliance is knowledge of, and acting in accordance with, the rules*". The reference to knowledge is significant. They stated that if compliance is to improve, it requires resources to be redirected away from those that individually cause the harm to those that are most likely to breach regulations. They suggest that regulation can have 3 meanings: 'a specific set of controls', 'a deliberate state of influence' or 'all forms of social control and influence'. The second one is interesting, as some regulation doesn't seem to have any influence. This all seems to suggest that the concept of regulation is becoming increasing pluralist.

2.4.2 Compliance with legislation

Environmental law is a form of 'social regulation', whereby the Government seeks to direct or encourage behaviour that would not occur without intervention. Various methods have been adopted by Governments including statute and common law intervention. Within social regulation, there are two predominant styles: 'command and control' and 'producer responsibility', with the later being used more and more. Another alternative is to use 'self-regulation' whereby businesses regulate themselves; most regimes tend to comprise a mixture of these approaches.

A distinction should be drawn between businesses complying with a regulation (e.g. registering as a waste carrier) and actually causing harm to the environment (e.g. fly tipping). The first is a failure to comply with a law, whereas the latter is a deliberate act (or one of negligence). This point is emphasised by Alexopoulou (2007) who identified the regulated community as those which 1) comply with the law because they believe in it (as long as they are aware of it), 2) those who do not believe in environmental laws and require enforcement action to make them comply, 3) this is the largest group - those who chose to comply based on the actions of the regulator.

The over-arching goal of environmental regulation is to protect the environment. Command and control aims to ensure that industry is responsible for ensuring environmental protection, whereas self-regulation relies on businesses to continually monitor and evaluate their own compliance. Some research indicates that self-regulation and enforced self-regulation are cheaper for both regulators and the regulated compared with government enforcement in command and control regimes (Fairman and Yapp, 2005). However, it has been noted that in firms that are *“too small to afford their own compliance”* (Ayres and Braithwaite, 1992:106), self-regulation may be unsuitable and therefore, ‘command and control’ regimes may be more appropriate. Despite this, there has been a general move towards self-regulatory approaches within environmental legislation.

Lynch-Wood and Williamson (2007) concluded that policy-makers cannot rely on the social licence (i.e. the expectations on a business as a result of societal pressures for example) to improve the environmental behaviour of SMEs – very few businesses go beyond compliance. The authors felt that for change to happen in the short to medium term, other forms of regulation such as direct regulation and economic instruments have to be used.

Compliance with legislation can be considered in two distinct groups - compliance in directly-regulated sites and compliance on sites (mainly SMEs) not directly regulated through any Environmental Permitting (formerly waste management licensing/ pollution prevention and control) regime. The EA (2008) makes this distinction very clear in its spotlight on business report, where it states that it is ‘not responsible’ for a large number of businesses. The potential impact of this is optimised when it reported that 57% of pollution incidents from businesses are caused by firms it does not directly regulate. Moreover, the report stated that about half of all serious industrial pollution incidents are caused by SMEs. An important caveat to this is included in the notes to the report - *“where we were able to identify the business responsible”*. This is important as due to the decrease in inspections and reliance on people to report incidents this might be the reason for the reported reduction in pollution incidents.

The relationship between good governance and compliance and enforcement is epitomised by Harman (2005), the former chairman of the EA who outlined the use of command and control legislation in the UK and how the regulation of SMEs can provide more difficulties than with large companies. He explained that SMEs usually have fewer resources to spend on capital investment and innovation, generally have poor environmental and legislative awareness and only have public pressure from the localised area. He felt that regulators need to use alternate approaches to encourage good governance within the sector as well as encouraging companies to go beyond compliance by explaining that there are additional benefits. He stated that regulatory approaches need to include advice and guidance to help businesses understand their legal obligations or the provision of incentives to encourage compliance.

Thus, there appears to be a changing face of compliance in the UK, through the introduction of new compliance systems. As systems change, then there is a knock on effect in how compliance is achieved. In particular and in response to proposals and recommendations by Hampton (2005), the Government has sought to make changes that will aid compliance, amongst other things. For instance, the options for streamlining the mechanisms of environmental permitting were a policy initiative that manifested itself in The Environmental Permitting (England and Wales) Regulations (2007); these regulations have since been replaced by regulations of the same name in 2010. This goes some way to demonstrating the Government's commitment to respond to the challenges posed by the Lisbon Agenda, the BRTF, the Hampton Review (2005) and to Defra's own commitment in its Five Year Strategy to reduce the administrative burden of regulation on industry (Defra, 2006). Although only time will tell if these changes have the desired effect on compliance, particularly when the new system does not seek to change who the regulator is; what is regulated; nor what standards have to be met. Thus, it is not clear what impact if any this will have on compliance other than that a significant amount of legislation has been revoked and replaced.

To measure compliance, there are generally 4 sources of information for regulators: 1) inspection, 2) SMEs self-regulation, 3) complaints from the public or 4) remote sensing and ambient monitoring. Because the 'environment' is so broad, regulators have to deal with a wide range of issues, this means that managing compliance, promoting compliance and responding to all violations is extremely difficult. This point is epitomised by the Organisation for Economic Co-operation and Development (OECD) (2004) who state that compliance with environmental regulations is rarely complete. The report highlighted that for OECD countries, 65% of regulated sources in the US may be in violation of air emission limits, and the compliance of Canadian pulp and paper mills with federal biological oxygen demand (BOD) standards in 1987 on an annual average was 69%. The European Commission, in 1996, published data indicating that even though Member States had notified implementing measures for 91% of the EU's environmental directives in 1995, 265 suspected breaches of the EU's environmental law were detected in that year. The report pointed out that actual compliance may even be lower than reported compliance, as the latter only indicate that the inspection agency has not been able to prove non-compliance.

The remainder of this section covers that published about SMEs subject to direct-regulation versus those who are indirectly regulated.

Directly-regulated

The EA is responsible for more than 2,900 industrial activities (EA, 2010), more than 100,000 consents to discharge to inland waterways (EA, 2006), approximately 7,974 waste management licences (now termed environmental permits) (EA, 2009) and over 12,000 smaller exempt facilities (EA, 2006). In addition, it manages 49,000 water abstraction licences ranging from those for water companies to individuals (EA, 2006).

For directly-regulated facilities, the EA uses the operational risk appraisal scheme (termed 'Opra' - from April 2008), which aims to assess the environmental risks posed by facilities and sets out the procedures an operator has to put in place to manage them. It was initially introduced in 2000 and was designed to enable the EA to target its regulatory effort at those activities that pose the greatest risk to the environment.

When first introduced, 'OPRA' (as it was known), (before evolving into 'EP OPRA' and then 'Opra') consisted of four attributes:

- 'Complexity' - the types of activities covered by the permit;
- 'Emissions' - permitted releases into the environment;
- 'Location' - the status of the environment around the facility; and
- 'Operator performance' - the management systems and procedures in place.

A fifth attribute has been added; 'compliance rating', which unlike the other attributes is completed by the EA after a permit has been issued using information from the EA's Compliance Classification Scheme (CCS), which assesses compliance with permit conditions.

Scores from each attribute are used to create banded profiles (A-E), the profile for each attribute is then used to create an overall points score, which is subsequently used to dictate the level of charging and regulation imposed. Compliance with non-permitting legislation does not directly affect Opra, moreover, regulatory breaches do not affect a facility's compliance rating (unless enforcement action is taken).

A significant issue identified by Ends (2005) is the way risk is assessed by the EA - the report explained that sites with historical problems are left with a legacy that take years to fix and thus significant improvements to the site will have little effect on the score applied - this lack of robustness does not encourage those to introduce extensive (and sometimes costly) improvements.

Ends (2006) reported that in 2005, poor management at industrial sites caused 1,731 incidents of non-compliance with permit conditions that may have led to serious harm. Interestingly, many of these sites were classed as "*well managed*" by the EA; this sits within the context that this only includes facilities that are inspected. This is corroborated by Ends (2006c) who reported that 80% of the 24,000 incidents reported to the EA in 2005 took place on SME sites not under direct regulatory control. These results clearly show that sites with all the necessary procedures/inspections in place can still cause pollution incidents.

Moreover, Defra has criticised half of all local authorities in England and Wales for not inspecting high-risk industrial sites as often as required (Ends, 2009). The same observation has been made in previous annual reports produced by Defra. The report revealed that 31% of local authorities failed to make the required number of full inspections; a problem that has been exacerbated by a lack of funding.

Bland *et al.*, (2004) reported the results of spot-check audits of waste transfer notes for transfers and deposits of waste. Their results showed that there was a very low level of compliance (5%) and this was corroborated by several subsequent studies (Wilson *et al.*, 2007; Wilson and Williams, 2008; and Fairman and Yapp, 2005; the latter from a health and safety perspective). The paper also reviewed how the duty of care is regulated and enforced in terms of fulfilling the aims of the legislation. The results showed that the number of prosecutions was extremely small when compared to the number of non-compliances.

A number of methodologies were used during these studies, including on-site 'spot-checks' and interviews with site operators and vehicle drivers. The types of sites visited included: transfer station, landfill sites, compost processing plants, soil recovery plants, chemical treatment plants, incinerators and drum washing plants. Interviews also showed that there was a very low level of

understanding of the legislation. This is corroborated by research conducted by Wilson *et al.*, (2007) and Wilson and Williams (2008).

The audit procedures comprised detailed examination of WTNs to check that it contained the 9 requirements of information, e.g. identification of the waste (quantity, container details, time and place of transfer). Only 26% of WTNs contained an adequate description of the waste; general descriptions such as “*muck*”, “*rubbish*”, “*builder’s waste*” were frequently used – these general descriptions also included hazardous wastes, such as asbestos and oils.

The requirement for holders of waste to know the quantity of waste being transferred was not well followed with individuals using general terms such as “*one load*”, “*one container*”. Weight was almost always recorded on the site of receipt on a document different from a waste transfer note, usually on a weighbridge ticket.

The results showed that out of a total of 1,113 deposits audited at 225 sites, only 336 WTNs were available with only 5% fully compliant. The level of compliance ranged from zero to nine percent. In terms of the level of compliance with the produced waste transfer notes, the level of compliance with the information requirements remained at 16% (Bland *et al.*, 2004).

Bland *et al.*, (2004) felt that the poor waste description was attributable to the transferors completing the transfer notes on behalf of their customers and thus they did not fully describe the type of business that the waste had come from or what exactly the waste was. The authors explained that in terms of the number of non-compliances, in 1997 and 1998 there were 10 prosecutions each and in 1999 only 5 prosecutions. However, over these 3 years, 92%, 91% and 96% of all deposits were non-compliant. This highlights that the number of non-compliances isn’t reciprocated by enforcement action.

Indirectly regulated (including SMEs)

Due to the lack of regulatory monitoring in those businesses not directly regulated by the EA or another regulator, there is a gap in empirical compliance evidence. Alexopoulou (2007) highlighted that interviews with regulatory officers showed how little knowledge they had of non-permitted sites. This was demonstrated by some officers reporting that it was difficult to know how to help non-permitted sites as “*they did not have any specific legislation to comply with*” – it is very worrying if this view is representative! This lack of knowledge is due to most enforcement officers not having any involvement with non-permitted firms. Some seemed to be completely unaware of what SMEs had to comply with.

Fairman and Yapp (2005) report similar levels of compliance to Bland *et al.*, (2004), albeit from a health and safety and food hygiene perspective. Moreover, research by the Building Research Establishment (Warren, 2006) into energy efficiency in homes (Part L Building Regulations) has shown that almost half of homes were breaking the law. Not only do many involved in housing development treat the energy efficiency requirements with disdain but the regulations are also not enforced. Warren reported that there has never been a prosecution for failure to comply with the energy requirements of the Building Regulations. Similarly, nobody has ever been sued for not bothering with Part L. The author sums up the situation:

“No other industry in the land is permitted to remain so cavalierly in breach of the law. The time has come to ensure that the nation’s carbon saving targets are met in practice. Not just in theory”.

In spite of the lack of compliance data, a wide range of authors have commented on the compliance process, meaning of awareness and the best ways to engage SMEs into responsive regulatory decisions.

Fairman and Yapp (2005) reported on the nature of the compliance process, explaining that compliance was not found to be part of a decision-making process. They explained that if businesses could not recognise that there was a difference between how their business operated on the ground and how it ought to operate in order to comply with legislation then they could believe they already complied and that no action was necessary.

SMEs tended to believe that information about regulations would be sent to them if it was important and relevant. SMEs relied upon outside agencies to provide them with information about relevant regulations, for example trade associations and trade publications. Therefore SMEs tended not to self-regulate their businesses, as they rely on others to advise them of what is relevant. Despite this, Williamson *et al.*, (2006) suggested that SMEs are driven by regulation and do attempt to comply. Although the authors admit that not all do comply, the paucity of the authors' methodology relates to the lack of comparison between actual compliance data and willingness to comply. The authors reported that SMEs showed a clear preference for targeted and specific information compared with less specific mail shots, although SMEs also noted a wish to be told exactly what they needed to do within their own premises.

Fairman and Yapp (2005) reported that the reasons for non-compliance were a lack of 'awareness' of legislative requirements, or inadequate knowledge about how to comply with requirements. They explained that a lack of awareness is often cited as the reason why businesses do not comply. However, they explain that it is important to examine what awareness actually means. They found that 'awareness' means not being able to relate legislative requirements to individual business operations – it is about recognising non-compliance. It could be easy to equate a problem to lack of 'awareness' with a solution of more information. However, more information in these cases will not make situation better, it may even make it worse by producing an information overload.

Fairman and Yapp (2005) reported that face-to-face intervention was the most effective way of making businesses recognise the existence of a 'gap'. They explained that after encouraging the recognition of a problem, the existence of an inspector then identifies ways of remedying this non-compliance, and these are received by the SME with an understanding of the enforcement power that the inspector has.

Inspections were seen as essential; however some inspectors questioned whether they should focus any of their resources on SMEs with low environmental risk. This approach meant that other methods were used during the introduction of new regulations or when firms were causing severe environmental harm. This meant that non-permitted firms, if not captured in these more targeted approaches, were assisted primarily through general sources of information, such as 'Netregs'.

2.4.3 Enforcement

“Compliance with EU legislation is essential if we are to achieve the overarching goal of EU waste legislation, which is to protect the health of European citizens and the environment” (Environment Commissioner, Stravos Dimas, 2010).

This quote came in the light of a report that recommended the setting up of a dedicated agency at EU level to tackle the underlying problems of poor implementation and enforcement of European waste law (as supported by Jackson, 2011). The difficulties surrounding enforcement of environmental legislation are outlined by Fairman and Yapp (2005) as they explain that SMEs pose challenges because of their numbers, diversity and their difficulty to penetrate. In this section, literature on the definition of enforcement, the enforcement policy and approaches used have been considered.

Richardson *et al.*, (1982) explained that enforcement can generally be defined as a “*process by which compliance is sought*”. The UNEP (1996) stated that enforcement is: “*the use of legal tools to assist in and compel compliance with environmental requirements and in some context, to establish liability or responsibility for harm to the public or to the environment caused by practices that pollute*”. This can include the use of legal authority to compel compliance, the establishment of requirements for remedies for any non-compliance or environmental hazards, or the development of information essential to determine compliance or appropriate means of achieving compliance. It also includes imposition of sanctions for the violation of laws or requirements.

Enforcement stems from non-compliance; however, the level of non-compliance is significant as some result in environmental damage (classified under CICS by the EA), while others may breach an environmental permit but not necessarily cause any damage (classified under CCS by the EA). In environmental terms, it seems like the degree of enforcement is centred on actual harm rather than preventative measures to avoid potential harm in the first place. This conflicts with many regulators’ philosophy of focusing on prevention, with purely arms-length advice and encouragement not sufficient. Weait (1989) provided an empirical examination of the reasoning behind the discretionary decisions of enforcement agents when considering potential formal response. The author explained that law cannot, and does not exist independently of its enforcement. Without procedures for its execution, it is a barren concept. The paper stated that there was a disproportionate amount of infraction letters compared to the number of prosecutions and that the enforcement authorities allow for a certain amount of emissions etc... before they will prosecute – this is termed “*presumptive limits*”.

This is also called ‘compliance tolerance’ with Hutter (1997) explaining this as “*sanctioned non-compliance*”, where a business does not meet the legal definition of compliance but which are nevertheless ‘acceptable’ to some inspectors. Reasons for acceptable non-compliance may be because the legislation is felt to be out-of-date or step with public opinion, there may be perceived difficulties in setting a business up in a particular sector or the economy may be fragile.

The majority of the EA’s enforcement documentation centres on its regulation of permits rather than of ‘other’ legislation as it expects businesses to voluntarily comply with these requirements. This leads one to believe that ‘other’ regulations are not being adequately enforced.

The varied approaches taken by enforcement officers to achieve compliance include criminal justice proceedings; administrative tools; and educational initiatives (Ogus and Abbot, 2002). There is also evidence to suggest that different enforcement bodies take different approaches depending on the circumstances; in general, the greater the environmental effect or potential effect, the greater the probability of prosecution.

In an attempt to set direction, the Sentencing Advisory Panel (2000) advised the Sentencing Guidelines Council (formerly the Court of Appeal) on appropriate and fair sentencing guidelines for environmental offences. The need for such action has derived from the fear that many businesses will not pay the cost of compliance, if the cost of non-compliance is cheaper. Moreover, many magistrates and judges do not have enough experience of punishing environmental crime; anecdotal evidence suggests that magistrates come across an environmental offence once every 7 years.

The specific offences covered by the Home Secretary's direction covered 5 areas: IPC and air pollution control (Environmental Protection Act [EPA] s.23 - this has subsequently been repealed by the PPC Act, 1999); waste offences (under s.33 of the EPA); Pollution of Controlled Waters (Water Resources Act [WRA] 1991, s. 85); Abstracting water illegally (under s.24 of the WRA, 1991); and Packaging waste offences (under The Producer Responsibility Obligations (Packaging Waste) Regulations (1997) (subsequently replaced by 2007 regulations) and the Environment Act, s.93 1995.

The EA suggests that it successfully prosecutes up to 700 times per year, with over 95% success rate (based on the number of prosecutions it takes to court) (Ends, 2006b) (in 2008 it prosecuted 251 companies – EA, 2009). Even considering the EA's prosecution policy this is a drop in the ocean compared to the amount of offences committed (based on compliance data from Bland *et al.*, 2004, Wilson and Williams, 2008, Fairman and Yapp, 2005 and Lee and Bartlett, 2008). However, it is recognised that a significant amount of these offences will not be linked to environmental damage; if that is the case then there is certainly call for research into the link between environmental protection and compliance with legislation.

Evidence of businesses' attitudes to enforcement, (in relation to the WEEE Directive) is that: "*a lot of businesses will ignore it unless they are forced not to ignore it*". Other consultees stated that the focus for monitoring and enforcement has been on those seeking to comply with the regulations not those actively seeking to evade it (BRC, 2006). This is supported by the UNEP (2006) and in the context of oil storage legislation by Lee and Bartlett (2008) who stated that most governments now have environmental laws and regulations but a lack of resources, results in failure to enforce the legislation.

This suggests that more enforcement or at least a more discretionary system is needed in order to prevent non-compliance. Thus, it is important to consider the impact regulator interventions have on compliance (Hawkins, 1990). This is supported by Alexopoulou (2007), who stated that a key factor in terms of low levels of compliance is a lack of enforcement as this re-enforces the idea that the legislation is not worth complying with. The author stated that even if the enforcement action seems excessive, this is not always a bad thing as it may be preventing something insidious. In addition, Abbot (2009) explained that if regulation is to be effective then it must be implemented and enforced in such a way as to maximise compliance.

Fairman and Yapp (2005) compared local authorities who intervened versus those who didn't. They concluded that external intervention by local authorities or by training colleges had a positive impact on compliance in the SMEs studied. The study also highlighted that there is empirical evidence to show that enforcement activity is better at achieving compliance with prescriptive requirements than with enforced self-regulatory requirements; interventions such as mail-shots and leaflets have not been shown to be effective in SMEs. It is important to take these results in context as the benefits from an increase in inspection activity is going to be relative to what was there before; as a consequence, the challenge is to be able to set a

benchmark level for inspection effectiveness (the impact of inspection frequency is discussed in section 2.6.4 below).

2.5 The Impact and Effectiveness of Environmental Legislation

The impact of environmental legislation has been considered from a number of perspectives; including the impact on the SME (during implementation and enforcement) as well as how effective it is in achieving environmental protection.

2.5.1 Impact on SMEs

A traditional, but not exclusive, UK-business view of regulation is that it has generally been a nuisance due to the restrictions placed on businesses (Ainley, 1995). However, this view is not necessarily consistent in other EU countries as suggested by Triebswetter and Hitchens (2005) whose results showed that the regulation of waste water, packaging waste and clean air has led neither to an improvement nor to a loss in overall competitiveness in the German manufacturing industry. Williamson *et al.*, (2006b) suggested that there is no conclusive evidence of the negative impact of regulation on economic growth due to the difficulties of separating regulation from other factors that may impinge on firm performance. The authors explained that regulation plays an important role as it bridges the gap between a firm's profit-orientated self-interest and the interests of society. If one business did not have to comply then that would be seen as a big advantage, but this would disappear if everyone didn't have to comply with the regulation. Clearly, many firms do not see the impact of not having any regulations. The big impact occurs when one firm complies and when another firm doesn't have to.

White and Parasher (2007) suggested that environmental regulation can positively influence competitiveness. The authors state that the most important conditions for providing innovation by regulation is the clarity, ambition and determination of the regulatory authorities to increase pollution prevention requirements and to use a range of instruments to do so, including strict enforcement. The authors accept that this conclusion goes against some of the current published literature.

The impact of environmental legislation is demonstrated at a number of levels; when it is implemented, enforced as well as its actual existence and accumulation. Crucially, whether there is a significant impact from legislation depends whether SMEs actually make an effort to comply.

Implementation

The effective implementation of environmental legislation is crucial to minimising the negative impact that can occur from environmental legislation. Ambler and Chittenden (2008) compared the UK and EU regulatory systems, finding them to be worlds apart with no effective communication between them. They also reported that MPs are failing to curb the flow of new regulation; in a review of 246 Regulatory Impact Assessments (RIA), the authors found that the UK's formal consideration of proposed European law arrived far too late to amend the legislation prior to enactment.

The report also suggested that there is no visible benefit from the EU Parliamentary Scrutiny Committee, with this resulting in a substantial cost to businesses. Moreover, UK-only regulation

requires a far stronger challenge from MPs who often rubber-stamp regulation without asking why the UK needs the regulation when the rest of Europe does not.

Gunningham and Kagan (2005) suggest that although regulation is promulgated by the Government, it is industry that has to devise ways of complying with it and thus, this determines how effective it is. The authors report that out of a survey of over 200 firms, the majority had no knowledge of sanctions imposed on businesses in their area and industry. Therefore, if businesses aren't aware of the legislation then how can it have a significant impact? However, it is also likely that because of the potential impact in terms of effort to comply, some SMEs simply ignored or didn't seek to comply with the legislation.

Gunningham and Kagan (2005) explained that those businesses which seek to comply respond differently to legal requirements placed on them, with some exceeding the requirements and others falling well short. This shows that there isn't consistency in how SMEs manage their compliance. Although the authors suggest that a culture of compliance is needed so that businesses aim to comply (rather than responding to the enforcement action), there is also evidence to suggest that the legislation could be clearer with 'what is compliance' being more transparent.

Existence and accumulation of legislation

The existence of legislation is regarded as a burden in itself. In fact, there may be up to 80,000 pages of European legislation (Williamson *et al.*, 2006) and over 500 EU Directives covering the 'environment' (Ebbage, 2009). Moreover, since 1997, more environmental legislation has gone through the UK parliament than any other area of law, except that covering finance and justice (Ends, 2008b).

The UK is often referred to as being over-regulated which is a significant problem for SMEs (Ehmann, 2007 and Hampton 2005), with many observers feeling that we are now over-regulated to the point where it is impossible to police the regulations effectively. Mandelkern (2000) also makes the point that the proliferation of regulation has made it impossible both for ordinary citizens and the legal profession to gain an understanding and practical knowledge of all the rules of law which affect them. However, this burden should not be overstated as in many cases, SMEs are not actually aware of the regulations and thus it is difficult to surmise if this is because there is too much to comprehend or whether SMEs are oblivious to its existence and are just not complying.

How companies respond to impending regulations is an important aspect of corporate strategy. Clement *et al.*, (2008) examined the direct relationship between size and the choice of strategic response level as viewed by regulators. Their results showed that larger firms generally favour more passive strategies; this may be due to the larger firms' willingness to use their slack resources; larger firms simply have the capability to comply with regulations.

This supports research by Baylis *et al.*, (1998) who provide an important example of the differences between the numbers of external pressures on SMEs and large companies. Although SMEs cite regulation as being the most common source of environmental motivation, their response (65%) was of a lower order of magnitude than that from large companies (86%). This is because SMEs are less likely than large companies to operate the 'dirtier' processes that are subject to permit-based regulation. Furthermore, even when permit-based regulation does relate to their processes, SMEs may still operate below the thresholds that some statutory

instruments exempt. Thus, only 26% of SME respondents were subject to permit-based regulation compared to 75% of large companies.

This is despite few SMEs having a good understanding of legislation. Further research suggests that a significant minority of SMEs assume that regulation will force them to make environmental improvements even though they have little knowledge of what legislation applies to them or any experience of regulation in practice. Some SMEs also have difficulty in distinguishing between health and safety legislation/ regulators and environmental legislation/ regulators. Indeed, their experience with the way health and safety legislation is implemented leads them to assume that environmental legislation is or will be implemented in a similar way.

The examples in Baylis *et al's.*, (1998) study referred to radioactivity in scrap metal with small firms being able to use exclusions and therefore are able to attempt more active levels of strategic response. On the face of it, these results seem to conflict with what you might find in the UK – smaller firms are not as proactive as this study suggests and the more support they are given the less they help themselves. Moreover, sometimes the support isn't that helpful as it often results in SMEs having to have a detailed knowledge of the regulation to be aware that there are exclusions/ exemptions for small businesses (i.e. exclusions in The Hazardous Waste (England and Wales) Regulations 2005 relating to requirements for 'premises' to be notified to the EA).

Baldwin (2004), on behalf of the FSB, suggested that a lot more is needed for the changes as a result of the better regulation agenda to have an impact on SMEs as well as some of the current initiatives, such as regulatory impact assessments not going far enough. Baldwin (2004) even suggested that the burden has increased, for instance, he reported that small firms' have 35% higher compliance costs than larger firms (this is presuming that they comply in the same way) and suggested that they cannot continue to absorb the ever increasing number of regulations that emanate from Europe and Westminster. Baldwin reported that surveys revealed that four out of five small businesses think that burdens are excessive. He explained that small firms are less resilient than large firms to regulatory changes; they have to carry out their own administration and do not have the capacity to employ regulatory specialists and so compliance related work diverts the attention of key managers away from normal business activities. Small firms are very dependent on regulators for assistance in interpreting their obligations, but from a regulator's perspective, small firms are elusive and hard to help. Baldwin (2004) also highlighted that small firms have particular difficulties with goal-based regulation compared to large businesses who often welcome the flexibility that this offers.

This evidence suggests that even though the better regulation movement has produced a large number of initiatives it has yet to deliver the better regulation that small businesses need.

Enforcement

The enforcement of legislation was considered from a number of perspectives (some of which have been considered in previous sections of this review). For instance, it was suggested by Fairman and Yapp (2005b) and Hutter (1997) that SMEs view compliance based on negotiations with the regulator rather than aiming to meet the legislation. This is significant as it suggests that for many SMEs the direct impact of legislation is minimal, with any impact being based on whether or not they are subject to regulatory inspection. Due to the level of inspection generally falling (Bell and McGillivray, 2006 and Ends, 2003) the actual impact of enforcement action on SMEs as a whole is not significant.

There are conflicting views as to whether more or less inspection is effective, as on the one hand Fairman and Yapp (2005) and Alexopoulou (2007) felt that it does, whereas other research suggested that there is no empirical link (Sniffer, 2008b and Sniffer, 2009).

Drawing on the example of The Packaging (Essential Requirements) Regulations 2003, a DTI (2003) report stated that the standards do not enable national enforcement authorities to assess clearly and indisputably whether a particular packaging item fulfils the Essential Requirements. This is demonstrated by the less than enthusiastic enforcement of the regulations since their initial introduction in 1998. Moreover, the report highlighted that it is difficult to distinguish between the impact of the regulations and changes that would have resulted anyway through commercial pressures i.e. lightweighting of packaging is not new. INCPEN (the Industry Council for Packaging and the Environment) has reported that yoghurt pots are 60% lighter than 30 years ago; plastic soft drink bottles are one-third lighter than when first introduced 30 years ago; plastic carrier bags are half as thick as 20 years ago; and drinks cartons are 16% lighter than 10 years ago.

Due to the report being based on research with large companies, 18 of the 22 respondents said that application of the procedures had resulted in changes to their packaging. The researched reported that enforcement of the Essential Requirements has encouraged discussions between the enforcement authorities and companies producing or distributing packaged goods. Once an enforcement procedure is in place to stimulate company action, the Essential Requirements Regulations are largely self-policing. The report highlighted that if sufficient pressure is not being put on the supply chain (i.e. where no big company is involved) awareness of the issues will not spread and compliance does not become a part of customers' commercial requirements. The report concluded that an enforcement regime needs to be in place for the system to work.

2.5.2 The Effectiveness of Legislation in Achieving Environmental Protection

A key test of the effectiveness of environmental legislation is whether it actually provides a higher level of environmental protection. The EA recognises this in its CCS scheme which classifies the level of risk based upon its potential impact on the environment (although environmental damage does not necessarily have to occur). This runs in parallel with the CICS, which classifies incidents against actual environmental impact. The judgement of 'risk' is crucial here as it dictates the level of enforcement imposed by regulatory authorities - as a consequence, the acid question is: does compliance with environmental legislation actually provide environmental protection? If there is no link between compliance and environmental protection then key areas of the law will (do) not need to be enforced and thus this needs to be corrected at a Government policy level. However, if there is a link and the assessment of risk does not identify it, then it is likely that significant areas of legislation are not being audited and enforced and that environmental harm is prevailing insidiously.

Some research has been conducted in this area by Remas (2006) and there is some evidence that improved site environmental management leads to lower average emission levels (although not necessarily a compliance issue). However, the strength of the evidence differs significantly between receiving media, regions of Europe and different sectors. Cheesbrough and Knuckey (2004) reported strong evidence that improved environmental management has an impact on the number of self recorded permit / licence breaches. The impact may be observed both positively (i.e. reducing the number), or negatively (i.e. increasing the number). The mix of positive and negative impacts for the compliance indicators demonstrates that improved site

environmental management results both in a reduction of the rate at which ‘non-compliance’ incidents (such as permit breaches) occur and in an improvement in the detection and reporting of incidents when they do occur. Where the scale of the first impact outweighs the second, the overall impact on the compliance indicator is positive. Where the reverse is true, the impact is negative (Cheesbrough and Knuckey, 2004). These results are broadly supported by Alexopoulou (2007).

Whether environmental legislation has a significant impact in terms of environmental protection is critical from a policy point of view. Thus it is a key area that needs to be researched in order that businesses take their responsibilities seriously and that the environmental regulators’ enforce the legislation effectively. This is supported by Adshead (2008) who stresses that regulation can only be effective to the extent that it is complied with and thus leads to the assumption that measuring the link between environmental legislation and environmental protection must be accompanied by a clear understanding of compliance levels.

2.6 Environmental Compliance Control Systems

This section of the review focuses on current environmental compliance control systems, to include the use of risk assessment, EMS, and compliance auditing.

2.6.1 Risk assessment as a compliance control mechanism

This section can be broken into 3 sub-sections - risk assessment policy, risk assessment science and how risk assessment is being used in practice.

Risk Assessment Policy

The majority of the commentary on this section can be seen in section 2.2.2; however, a number of key issues are emphasised below.

Better regulation has been the focus of a considerable amount of recent Government initiatives, with Hampton (2005) in particular suggesting that part of the solution is to regulate business using a risk-based model (further advocated by the Waste Strategy for England [2007]) as explained by Wilson and Williams (2008) – see section 4.2.2.

The EA already use a risk-based system to dictate the frequency and scope of regulation visits for those businesses falling under The Environmental Permitting (England and Wales) Regulations (EPRs). This system – ‘Opra’ (from April 2008) is termed “*modern regulation*” by the EA (2006) and its aim is to drive environmental improvement. However, the system has some flaws; for example, those businesses not included in any permitting regime are unlikely to be audited for compliance against any environmental legislation and hence a significant portion fall out the current risk umbrella and go un-inspected (Gunningham, 2002).

The use of risk assessment certainly has its merits; however, the key issue is how the principles are adopted and crucially what criteria are used to assess risk. Risk assessment should be used as the mechanism by which we decide the level of control needed, rather than being used as a justification for less inspection, where convenient.

Risk Assessment Science

Since the mid 1990s, environmental risk assessment has become an increasing feature of modern environmental regulation and has been used to target risk management actions on the key drivers of risk across a range of anthropogenic and natural hazards (Pollard *et al.*, 2006). The science of risk assessment is well established with key literature suggesting that risk assessments should be used to inform decisions (i.e. evaluating consequences), rather than being the approval mechanism for them (i.e. justifying an action) (IEMA, 2005).

Risk is defined as “a combination of the probability, or frequency, of occurrence of a defined hazard and the magnitude of the consequences” (Chartered Institution of Water and Environmental Management [CIWEM], 2006). Only through understanding both probability and consequence can effective management strategies be implemented.

Generally, risk analysts are concerned with the causal chain of events which can be divided into three different risks (based on Holdgate’s (1979) pollution pathway model):

- ‘Source’ risks: associated with an event or combination of events that deviate from normal operating conditions and may result in a release to the environment (e.g. a spillage risk).
- ‘Pathway’ risks: this addresses the likelihood of exposure of an environmental receptor to a hazard following an initial release (e.g. the proximity of a stream to transfer the spillage of a toxic substance to an ecologically diverse site).
- ‘Receptor’ risks as a result of exposure (e.g. ecological effects as a result of exposure to toxic substance).

Pollard *et al.*, (2006) explained that the basis of risk assessment is an evaluation of the connectivity between the source of a hazard and an environmental receptor (something we wish to protect). Without a “*dose*” (a duration of exposure to a harmful agent), there can be no harm at the receptor and therefore, one purpose of risk assessment must be to evaluate the likelihood and consequences of determining this harm.

The CIWEM (2006) suggested that risk assessments should be used as part of enforcement strategies focusing towards activities which cause pollution as well as those which result in regulatory non-compliances - as is used when considering significant environmental aspects in EMS. This provides evidence for demonstrating that compliance is linked to the causes of pollution.

Pollard *et al.*, (2004) explained that the use of risk assessments can have their limitations as they may not take into account the latency of the impact or its reversibility or the uniqueness of the resource which was damaged. In addition, the use of Holdgate’s (1979) source-pathway-receptor model is not necessarily sophisticated enough to consider all mitigation and/ or exacerbating circumstances such as the quality of site management. Pollard *et al.*, (2004) explained that a key difficulty comes in assessing and prioritising the risk as opposed to measuring the impact from a large set of diverse environmental threats in order to design policies and regulatory responses. The authors’ stress that it is better not to rely on the use of weighting systems as this is a crude way to determine risk.

Vivian (1999) outlined some of the difficulties with risk assessment and explained that it shouldn't necessarily be relied upon because of the difficulties in precisely quantifying the consequence of a hazard. He prefers the terms 'risk-estimation' rather than 'risk assessment' because without quantified and statistically significant probabilities, an organisation must use a technique to estimate risk that relies on an element of subjectivity.

A further complicating factor for environmental risk assessment is the lack of an easily defined measure of what constitutes 'harm' to the environment. In some cases, definitions of environmental damage are laid down in statute, but in others, appropriate criteria will need to be selected on the basis of scientific evidence and social judgments.

Risk Assessment in Practice

The 'Opra' methodology developed by the EA is an example of a semi-quantitative approach to risk assessment with the prime purpose of targeting the regulatory effort on high hazard, poorly operated facilities. This is achieved through the assignation of risk scores to a set of pre-determined attributes that, when aggregated, inform the overall risk appraisal.

In the context of EPR (then known as waste management licensing/ pollution prevention and control), environmental risk assessments are used to enable the operator and the EA to identify what risk management options, or mitigation measures, are required to adequately prevent, control, minimise and/or mitigate the identified risks to the environment from that site (Pollard *et al.*, (2000). These measures are normally stipulated as permit conditions or in the working plan (now termed 'accident management plan'). As a result, there seems to be a direct link between meeting the EP conditions and safeguarding the environment; as a consequence it would be prudent to frequently audit for compliance as a control mechanism for environmental protection. This would reflect the 2004 revisions to ISO 14001 which require certified organisations to conduct regular evaluations of legal compliance as part of the auditing regime (ISO 14001: 2004).

This tool, although generally welcomed by industry, is criticised for its lack of robustness and specificity to a site. It relies on purposely developed ranking matrices that define what level of actions or progress against a specific issue or question is required to achieve a certain number of points. These tools are often considered to be an effective, although relatively simple, method of assessing relative priority or ranking of risks but can suffer from inflexibility by the nature of being predefined. This has resulted in the development of 'shell' risk assessment templates that are used by the EA to assess risk on sites with similar characteristics.

The use of shell-type risk assessment strategies by the EA suggest that all sites pose a similar risk. Even though some industries and the perceived risks from some sites are well known, it is not necessarily best to classify all sites within the same banding as there are lots of other variables which have to be considered before a complete decision can be made about risk.

The use of semi-quantitative indicators to score probability and consequence and to rank risks can assist where there is a need to understand whether the risks in question are driven by the probability of their occurrence or by their consequences if they do occur (Pollard *et al.*, 2000). However, scoring systems (particularly those employing numerical scales) can be subjective and lead to different results from different assessors. As such, they should only be used where clear definitions of the scores allow accurate repetition. If this caution is applied, scoring systems can add value to the assessment by supporting identified risks to receptors and

assisting in the management of risks to meet regulatory requirements. The requirement for statutory risk assessments is not going to go away, as under the Regulatory Enforcement and Sanctions Act (2008), ministers only give regulators the power to use administrative penalties if they comply with the Hampton recommendations.

The application of risk assessment, as reported by Ends (2003), suggested that overall numbers of inspections carried out by the EA had dropped by almost a third since 1997. The biggest change in absolute terms occurred in inspections of licensed waste sites, which were down by more than 10,000 from the previous year (the number of waste facilities [excluding landfills] and material handled has been increasing since 2000 - EA, 2009). Ends (2003) reported that some of this decline may be attributable to the move towards risk-based inspection. Other factors include permitting backlogs and internal re-organisation, which kept inspectors out of the field.

A subsequent Ends report (2006b) highlighted that even though pollution control inspections continued to fall in 2005, there had been a shift to more in-depth site audits, leading the EA to state that the true level of regulatory inspection effort was being underestimated. Ends (2006b) explained that the EA now only reports on outcomes (i.e. pollution and operator performance) rather than the number of inspections it undertakes. It also stated that although compliance units seem to be a more accurate method of measuring, the picture it gives of EA performance is not transparent. It explained that inspections have declined; under IPC they have nearly halved since 1997/8 (when compared with 2005/6), while inspections on waste management sites have dropped by a third.

Hutter (1997) suggested that smaller sites are generally visited less than larger sites; not because there was a lower risk of accidents (they seem to have a higher risk), but because the risk of catastrophe was lower. This is an interesting counter argument to the idea that small sites are less risky, with perhaps the real argument being that whilst they may be high 'risk', the potential 'hazard' is not high enough for them to be directly regulated.

2.6.2 EMS as a compliance control mechanism

EMS such as BS EN ISO 14001:2004 (British Standards, 2004) have been used since their introduction in 1996 and generally are perceived as providing benefit to businesses in terms of reducing their environmental impact and managing their compliance. The Remas project specifically sought to measure the impact an EMS could have in terms of environmental performance and compliance (Cheesbrough and Knuckey (2004).

The project found a reasonably strong link between better site environmental management and regulatory performance, although the effect of this differs in regions of Europe. However, the report highlights that the overall regulatory approach (i.e. the mix of permit levels, numbers of inspections and enforcement strategies) has a strong influence on the apparent outcome of this relationship (Remas, 2006).

Although the research was conducted in facilities directly regulated by enforcement agencies, the authors felt that if EMSs could be used as a type of permit it would allow a better relationship to be developed between the inspector and the business (the EA's Opra system now incorporates considerations for EMS use in its assessment of sites as well as in its Compliance Assessment Plans [Ends, 2006c]). Interestingly, it also points out that better compliance control systems may reduce the risk of non-compliance rather than actually guaranteeing compliance which falls short of what may be initially expected by an EMS.

In contrast, Ends (2005) reported that many of the biggest companies had the worst Opra score and almost a third had a certified EMS. This shows that although EMSs can be useful, they should not necessarily be taken as a direct indicator of a high level of environmental performance and compliance. Ammenberg and Hjelm (2002) who questioned the continual improvement guarantee an ISO 14001 certificate brings, if there is any improvement at all. The authors state that there is no doubt that EMS used correctly might lead to significant environmental improvements. Nevertheless, it reported that it is worrying that an EMS certificate does not distinguish between a company that has improved and a company that has not.

Gunningham (2002) explained that although there are significant potential benefits available from adopting an EMS, he recognises the perception that EMS are perhaps more suited to larger companies; this is supported by Hillary (2003) who at the time reported that the total uptake of formal EMS is less than 1% of the total UK enterprise population. As of June 2010, there were 8,648 ISO 14001 registrations from UKAS accredited certification bodies (IEMA, 2010) (non-UKAS registrations are unknown but thought to be significantly more); representing only 0.184% of UK businesses. However, Gunningham explained that a less formal, less sophisticated version of an EMS could be as effective in an SME as the full version in a larger company. By reducing the level of sophistication (and thus the cost), Gunningham cautiously suggests that SMEs can adopt EMSs and be successful.

Alexopoulou (2007) broadly supports the work conducted by Cheesbrough and Knuckey (2004) even though there is no statistical evidence to show that EMS provide a higher level of regulatory compliance, she did report that EMAS does seem to be more rigorous due to the need to provide an externally scrutinised environmental statement. Dahlström and Skea (2002) surveyed 843 facilities regulated under the UK's Pollution Prevention and Control (PPC) programme and concluded that having an externally validated EMS was associated with higher levels of procedural performance by those facilities (such as recording and use of information, plant maintenance and management and training). However, these facilities were neither more nor less likely to suffer from incidents, complaints or non-compliance events than those without. They also were neither more nor less likely to be subject to enforcement action. Therefore, they concluded, reducing the degree of inspection for sites compliant with EMAS or ISO 14001 was unlikely to lead to a better targeting of public resources, although some form of regulatory relief was warranted. This is supported by Dahlstrom *et al.*, (2003) who reported that the main benefit of an EMS is that sites become easier to regulate because of the more organised paperwork rather than necessarily being more compliant. Other findings from Dahlström and Skea (2002) showed that sites with an EMS tended to improve their operator performance more quickly than those without, and that sites registered under EMAS tended to perform better than those certified to ISO 14001. This reflects the fact that EMSs are highly variable and have great uncertainty in their compliance and environmental performance related outcomes. It is therefore difficult to define and weigh the significance of the different strengths/ opportunities and the weaknesses/ threats as they depend on many factors such as the type, scope of EMS and facility motivation for implementing the EMS. On the other hand, an EMS has more strengths and opportunities concerning efficient use of regulatory resources. These strengths and opportunities could lead to removing a relatively important economic burden of the regulatory agency and therefore outweigh the weaknesses and strengths.

2.6.3 Compliance Auditing

There has been little research on auditing specific environmental legislation, with existing literature concentrating on general auditing techniques. In spite of this, Harris (1996) highlighted the importance of environmental auditing as a tool for improving compliance by arguing that environmental auditing offers a supplementary effective enforcement mechanism. Moorman and Kirsch (1991) emphasised the importance of justifying an audit's integrity, some of which is down to ensuring the auditor's independence. They emphasised the importance of management commitment, which goes a long way to ensuring that the auditor has access to all the necessary information as well as adequate resources so that all objectives can be fulfilled. They advocated the use of a number of approaches, including an examination of the site and its operations, interviewing company personnel and analysis of the company's environmental documentation. This is supplemented by the European Union Network for the Implementation and Enforcement of Environmental Law (1997) who highlight the fact that planning for a survey should include the use of performance indicators and historical inspection results. The European Co-operation for Accreditation (2007) explain that there is no set method as to how to audit compliance but that there are some basic indications that can be used. In addition, Moorman and Kirsch (1991) suggest that there should be a logical and systematic approach to conducting the audit, which they break down into 3 stages:

- pre-audit;
- audit; and
- post-audit activities.

Auditing is central to the certification process for internationally recognised EMSs such as ISO 14001 and is seen as an excellent mechanism for ensuring good environmental practice. More specifically, the standards for auditing quality management systems (QMS) and EMSs are set out in ISO 19011 "*Guidelines for Quality and Environmental Management Systems Auditing*"; it aims to provide flexible guidance for auditing practices that can be used across any organisation without attempting to be exhaustive or specific to any one type of operation (Carter, 2003). As well as setting out the principles of auditing - "*ethical conduct*" (trust, integrity, confidentiality and discretion) and "*fair presentation*" (due professional care, independence and evidence-based approach), the standard sets out plans for managing the audits and states what audit activities must consist of. The international standard ISO 14015 "*Environmental Management-environmental assessment of sites and organisations (EASO)*" also provides guidance on how to conduct EASO through a systematic process of identifying environmental aspects and determining their consequences. Although these standards provide a more complex structure than that suggested by Moorman and Kirsch, the 3 key stages of auditing can still be elicited from the standards. Nevertheless, neither of these ISO standards provides guidance on how to conduct regulatory compliance audits; this is both a weakness and an opportunity.

2.6.4 Improving compliance control systems

In this section, the following additional mechanisms are discussed: regulatory changes, an increase in inspections as well as questioning what we think and understand about SMEs.

Regulatory changes

There can be little doubt that there are issues with environmental regulation. Robinson (2009) suggests that there is a lot we could do to improve this, including looking at how other countries

implement environmental law. Robinson stated that although there is a range of bodies in the UK, there is no equivalent of the Legislation Design Committee (as is in place in New Zealand) whose job it is to scrutinise the quality of environmental law. The LDC's purpose is to provide advice to Government Departments on the development of legislative proposals and on drafting instructions to Parliamentary Counsel. They look at the relationship of the proposed legislation with existing law and the coherence of the statute book as a whole. They pay particular attention to the accessibility of the legislation to citizens and compliance with related international obligations. Considering the law in context is very important as each regulation may be ok on its own but when not when added to other law. This is supported by Hopkins (1994) who stressed that we need to be clear what we are asking people to comply rather than just how we regulate.

The UK Anderson Review (2009) sought to assess and improve Government guidance on regulation. However, it based all its conclusions on a small sample of telephone questionnaires and it grouped most of its questions on the environment with health and safety and/ or split it up into smaller topics. The research was in favour of prescriptive legislation, however, due to the paucity of the methodology (no triangulation methods) and naiveness of some of the questions – of course SMEs will say that they want more help; little can be drawn from the conclusions. The research also suggests that many businesses over comply - this doesn't seem to be based on any real research or evidence and is purely anecdotal. Moreover, those SMEs who agreed to be interviewed are likely to be a little biased and unrepresentative of all SMEs.

Gunningham (2002) suggests that a more tailored SME focused strategy is needed to try and overcome the barriers to better compliance in SMEs (as supported by Sniffer 2008). Gunningham (2002) posits that an amalgamation of policies is needed to tackle the identified barriers inherent to SMEs as well as establishing industry specific regulation. He suggests that a hierarchy of controls could be used, including: incentives, the dissemination of information, the provision of guidance, 3rd party leverage as well as the traditional command and control legislative strategies for those recalcitrant individuals - although he also acknowledges the limited resources of regulatory agencies and the limited reach of many legislative strategies.

Gunningham feels that the two best options are self-assessment and self-audit. These should be similar to EMSs but should be less ambitious in terms of scope and strive for regulatory compliance rather than continual improvement. Moreover, Gunningham stated that without an effective enforcement system, there is no leverage to get an SME to comment to self-auditing never mind compliance. This is epitomised by the fact that in the area of work safety an SME can expect to be inspected every 80 years, but that SMEs are unlikely to ever face an environmental inspection.

Hopkins (2007) supports many of Gunningham's views and explained that the use of prescriptive regulation takes away (in most cases) that element of subjectiveness as to what exactly the inspector feels is at risk. He suggests that implementation of the following will improve compliance rates:

- auditing the auditors;
- proactive investigation;
- supporting company safety staff;
- advising on organisational design;
- exposing performance; and
- promoting regulatory crisis.

Although more contentious, the use of more regulation is supported by Baylis *et al.*, (1998); the authors stated that compliance with regulation is the most common source of environmental motivation for all sizes of company. Therefore, this suggests that it might be more effective to improve industrial environmental performance through the extension of regulation rather than by persuasion.

This is supported by Petts *et al.*, (1999) who explain that whilst there are benefits to self regulation, the evidence suggests that environmental performance itself may not be improved, only the outward signs or the public perception of that performance. The authors explain that self-regulation requires businesses to do more for themselves, even though what should be done may be unclear. Regulation is more certain and can provide a stronger support mechanism in which a company can operate. It has been argued that if regulation is stable, predictable, time efficient and supported by technically strong regulators it does not need to stifle innovation and competitiveness (this is supported by a number of authors in section 2.5).

Baylis *et al.*, (1998) suggests that offering personalised site-specific help to overcome SMEs lack of understanding of how environmental regulation affects them would be more constructive and more likely to result in ecological modernisation at the level of individual firms. Baylis *et al.*, (1998) also reported that as a result of the links between company size, regulation and motivation, those businesses regulated under permits (i.e. directly regulated) are more motivated by regulations than those falling under purely incident based regulation (i.e. indirectly regulated) (89% compared to 61%). The authors explain that this is due to incident based regulation being intrinsically a less significant form of motivation than permit based regulation because it is not supported by site visits and interviews with environmental regulators. It is clear that in many ways, incident based regulation is open to voluntary compliance due to the absence of any real threat of prosecution except in extreme cases. The authors go on to say that the difference in motivation is exacerbated by the limited amount of contact with regulators; many of the incident based regulated companies claim to have never seen an environmental regulator.

Rutherford *et al.*, (2000) suggest that SMEs need to be directly targeted with regulation and explain that this is likely to be the only way to make SMEs alter their practices and therefore improve environmental sustainability.

An increase in inspections

Williamson *et al.*, (2006) reported that the most important need for SMEs was for clear information on regulations, closely followed by direct guidance and individual support (i.e. handholding). The need of direct support for SMEs is supported by Fairman and Yapp (2005), Alexopoulou (2007) and Howarth and Fredericks, 2011.

Although the above doesn't advocate increased inspection on its own, it is felt that inspections and support could be dovetailed. Alexopoulou (2007) reported that despite their resource intensiveness, regulatory inspections are the most effective and reliable compliance assessment method that can achieve an acceptable level of compliance with efficient use of regulator resources! Her research also reported a link between inspection frequencies and operator performance; she reported that a number of empirical studies on the subject concluded that increasing the frequency of inspection leads to improvements in regulatory compliance performance and also sometimes in increased self monitoring from the facilities.

This research is supported by Magat and Viscusi (1990) and Hutter (1986). The former found that each inspection reduces the mean value of reported discharges of BOD by approximately 20%. They also found that inspections have a permanent effect on discharges (Laplante and Rilstone, 1996). The authors concluded that both inspections and the anticipation of future inspections lead to reduced emissions. They also showed evidence that the benefits of inspections are not simply limited to reducing pollution emissions; they also provide the regulator with more information by inducing more frequent self reporting by industry. In particular, increasing the probability of inspections can induce a significant change in plants' pollution behaviour. These results have direct implications on the allocation of scarce monitoring resources. The authors also suggested that even though inspections may not induce a plant to comply with the standard, they may nonetheless induce the plant to reduce the amount of emissions by which it exceeds the standard.

Alexopoulou refers to Cohen's research (2000), which outlined the theory of environmental deterrence, which suggests that potential offenders respond to both the probability of detection and the severity of punishment if detected. Therefore the author stated that an increase in monitoring activity, which raises the likelihood that the offender will be caught, will subsequently enhance deterrence. However the deterrent effect of increased monitoring activity is also based on the fact that an increase in the probability of detecting a violation increases the probability of imposing monetary sanction to the violator. If the fine is low as in the case of the waste management industry the deterrent effect is reduced. Overall empirical studies have found that increasing inspection frequency leads to reduced pollution and therefore better compliance (Cohen, 2000).

Sniffer (2008b and 2009) aimed to improve our understanding of the relationship between inspections and compliance, and to make some suggestions on how the regulators could improve compliance by modifying the way they inspect and improve ways of storing data and monitoring compliance. The analysis was conducted using available data from the Scottish Environmental Protection Agency (SEPA) and the Northern Ireland Environmental Agency (NIEA), however data constraints only enabled "*first observations on the links between inspections and compliance*" to be made. Although the study was able to assess the effectiveness of the current inspection regime, it was not able to predict the effect on levels of compliance of increasing or decreasing the rate of inspection. Because of the inconclusive results of the analysis of compliance and inspection frequency, the authors were not able to suggest any recommendations for inspection frequency. The research was based on the idea that the more a site is inspected the higher the levels of non-compliance there would be. Interestingly, this was based on the idea that these inspections are based on riskier sites with more/ complex permit conditions, rather than on the simple fact that more inspection would allow for more opportunity to identify non-compliance.

The research failed to identify previous research in support of more inspection as it suggested that the "*notion*" that an increased frequency of inspection leads to increased compliance appears to be supported only by anecdotal evidence and has not been clearly or unequivocally demonstrated. The literature suggests that other aspects such as industry sector, company culture, size, location, time of year and time since last inspection help to explain the level of and variation in compliance.

These conclusions are countered by Alexopoulou (2007) who after conducting interviews with regulators found that they recounted experiences where compliance and or environmental performance had lapsed after fewer inspections were carried out. Moreover, she also reported

that inspection officers reported that regular inspections gave agencies a face and were also important for giving out advice.

Sniffer (2009) appeared to have the following flaws:

- The research didn't include any inspections – inspections were evaluated retrospectively.
- The research didn't assess each site on an individual basis; it measured overall compliance in those areas that were inspected more.
- There is doubt about whether the researchers measured the right thing, i.e. results were based on previous inspections conducted rather than increasing the level of inspection on one site and measuring the improvement.
- The research did not consider sites with no inspections.
- The research failed to identify the fact that the effectiveness of inspections isn't absolute; it changes over time as the company evolves and responds to inspections.
- Compliance was not assessed over a period of time to identify changes.
- There was no detail of the complexity of the audit or the length of time on site.
- The research did not consider the impact of a decrease in inspection nor did it consider the relatively of one level of inspection compared to another e.g. an increase in inspection may not improve compliance if there already is enough inspection in place, however, a decrease may have significant consequences.

In summary, it is believed that it can never be absolute that more inspections will mean better compliance but there will be a level where compliance is maximised. The different regulatory systems, business type and management level are too complicated for compliance and inspection frequency to be measured on their own.

Understanding SMEs

Gunningham and Sinclair (1999) suggest that we need to use a range of approaches to successfully address all environmental problems in all contexts. Williamson *et al.*, (2008) explain that the evidence suggests that existing environmental policy and approaches have largely failed to change the position of SMEs from being largely ignorant of their environmental impacts and regulatory obligations. As a result, the use of environmental compliance improvement programmes are likely to remain inert and because SMEs are likely to avoid regulatory scrutiny they remain untouched by policy initiatives.

Williamson *et al.*, (2008) aimed to summarise the environment agencies current SME programme as well as make proposals for a possible SME strategy that could be implemented by the regulators. The research developed 4 environmental compliance orientations of firms:

- Most difficult to control;
- Most vulnerable;
- Most easily controlled; and
- Most compliant.

Hillary (2004) suggests that in order to understand SMEs, they need to be studied in much smaller, more refined categories in order for more specific, concrete conclusions to be made. As an example, Hillary (2004) recommends that any future research is conducted on SMEs by sub-group (micro, small and medium) or by industry category rather than as a collective.

Williamson's review covered the Hampton, Macrory, Roger, Davidson and Wallace Reviews. It stated that SMEs are essential to meeting the HM Treasury's 2008 Enterprise strategy and that, in line with the 'think small first' policy, future regulation of small businesses needs to:

- Have a presumption of regulation only where necessary and of devising practical exemptions when developing policy;
- Introduce a new approach to regulating small firms (fewer than 20 staff and a turnover below £2.8m); and
- Examine whether small firms can be exempted from new measures or be subject to simplification of enforcement.

Alexopoulou (2007) suggests that non-prescriptive (i.e. goal based regulation) was the most difficult to comply with. This is because firms have to work out their own obligations and then adapt them to the business. Most support agencies also thought that inadequately defined terminology exacerbated compliance issues - packaging, WEEE, RoHS were cited as the most problematic. Alexopoulou also suggests that most support came from online sources but that this was only useful for those who adequately sought it (a problem emphasised by Richard, 2008).

Williamson *et al.*, (2008) stated that it is clear that SMEs have a significant environmental impact and that existing compliance approaches only influence a proportionally small number of businesses. The authors state that the key is to increase the amount of allocated resource. This is supported by Hutter (1997) who stated that while self-regulation is desirable it was not sufficient to maintain acceptable levels of compliance. Clearly there is a need for a balance between different methods of assessing compliance. Inspectors are able to collect vital information in their monitoring of sites and assuming that their inspections are used efficiently they can be used to improve compliance.

The authors explained that although large firms have potentially larger impacts, they have a concomitant level of awareness and expertise that reduces the risk. Likewise, because SMEs have less capacity and pressure to comply (which is aggravated by their numbers) they produce a significant non-compliance risk. On the basis of this, they suggest that most resources go where they are least needed, particularly in terms of 'risk of breach' and 'ability to comply'. Despite this, other research has shown that compliance is poor in both heavily regulated and non-regulated firms, therefore there may be some benefit in moving resources away from larger companies to businesses in certain sectors.

The authors recognised that it could be counter intuitive to divert all resources to SMEs and away from larger businesses due to the political, financial implications as well as the original argument being based on aggregated rather than single SMEs and thus there would be a lot of firms to visit/ regulate. The research-based methodology is about linking a regulatory strategy to the compliance capacity of firms: the risk of non-compliance should be the focus of regulatory policy. This means moving inspections from the 'most compliant' (less vulnerable) larger firms to the 'most difficult to control' (more vulnerable) smaller firms, i.e. increase visibility through targeted inspections in poorly performing sectors and geographical areas for the difficult to control firms and vulnerable firms. They suggest, redistributing environmental permitting income to non-permitted firms to improve sector performance and reduce free-rider problems in the most difficult to control and most vulnerable firm domains.

The research didn't consider a number of key pieces of research, including that conducted by Fairman and Yapp, that looking at actual compliance levels, the comparisons between permitted and non-permitted firms, the effectiveness of environmental legislation (implementation, enforcement and environmental protection), analysis of EA Opra/ CAR and management of other regulations. It doesn't go beyond the model - i.e. suggest how it will be achieved.

2.7 Summary

This review has summarised previous work on environmental compliance in SMEs from a number of perceptions. It analyses the key policy issues from a European and UK perspective, covering the principles of environmental regulation, implementation of EU legislation and SME support schemes. It considers the large body of literature on UK SMEs and it explains the reasons why many see SMEs as difficult to work with as well as highlighting some of the current SME support schemes available. The definition of compliance has been discussed as well as data published on SME compliance and enforcement of environmental legislation in 'directly' and 'indirectly' regulated SMEs. The review considers the impact of environmental legislation, focusing on how it affects SMEs as well as the link with environmental protection. Finally, the review considers the current environmental compliance control systems for SMEs, including the use of risk assessment, environmental management systems and auditing as control mechanisms.

It is clear that whilst there is a large amount of literature available, the research aims in Chapter 1 could not be adequately answered without further analysis. In particular, the following gaps in knowledge could not have been addressed without using the methodological techniques set out in Chapter 3:

- There is a lack of environmental compliance data, particularly in SMEs not directly regulated by the Environment Agency. Of the data that exists, it only provides high level compliance information for environmental permitting legislation; there is little compliance data for non-permitting legislation.
- There is a lack of documented methodological approaches about compliance auditing.
- The awareness and perception of environmental compliance has not been correlated with compliance levels.
- The literature on the impact and effectiveness of environmental legislation on SMEs primarily reflects SME opinion (only). As a consequence, there is little research drawing together both the 'letter' and 'spirit' of the law compliance data as well as both SME and other stakeholder opinions, particular in relation to how environmental legislation is implemented and enforced.
- There is little research investigating the link between compliance with environmental legislation and environmental protection. Measuring this link should be accompanied by a clear understanding of compliance levels.
- There is a lack of understanding of the best policy/ strategy to reduce the environmental impact of SMEs. In particular, more research is needed to identify the level of risk imposed by SMEs as well as how best to improve the compliance control system for SMEs.

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CHAPTER 3

METHODOLOGY

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3.1 Theory

The research aims and objectives were established following a detailed literature review to identify the intellectual gaps in the topic area.

Supporting the key principles of social science research theory, empirical evidence has been generated by using both qualitative (in order to enquire) and quantitative methods (in order to validate); a multi-method approach is supported by Corral-Verdugo (1997). In addition, a number of data sources have been used to provide a holistic understanding of the topic area; thus supporting the principles of 'triangulation', as suggested by Bell (1999), Hardy and Bryman (2004) and Cohen and Manion (2000).

Observations of participating SMEs' compliance practices as well as self-reported experiences from SMEs and other stakeholders were analysed. This ensured the research aims and objectives could be met as well as allowing appropriate conclusions and recommendations to be drawn. This approach enabled the establishment of compliance data for participating SMEs as well as providing insight into how SME compliance control systems can be improved. Moreover, by using epistemological and hermeneutical approaches, the nature, extent and validity of SMEs' (and the individuals working within them) opinions and knowledge (by monitoring actual behaviour and processes) could be studied.

Emerging themes were identified from within the qualitative data and used to support the quantitative data generated. The use of in-depth qualitative data collection techniques to explore and augment quantitative data such as compliance processes and levels is supported by Fairman and Yapp (2005). As a result, the focus was to target a relatively small research *population* but generate *rich* data, rather than producing a large amount of *shallow* data.

3.2 Focus of Study

Industries thought to have a potential environmental impact but likely to fall 'under the radar' of frequent regulator inspections were targeted. Specific industry types and locations are outlined in subsequent sections. Research was also conducted in directly-regulated SMEs for comparison and so that the current compliance system could be evaluated.

3.3 The Research Environment

Because research does not happen in a vacuum, it is important to acknowledge the issues that arose during data collection:

- Since the research is about compliance, a potentially significant issue was the repealing, revocation and/ or amendment of key legislation. Although this could generally be predicted due to the requirement for Government to openly consult. It occasionally played havoc with previously established methodology tools that had to be altered when legislation changed.
- The development and trialling of the methodologies (2005-8) was a particularly busy time in the UK statute book and had to be taken into account when considering compliance with the regulations studied. Where changes occurred, SMEs were audited against the requirements of the new and old legislation. For instance, the methodology

generation and data collection phase coincided with the introduction of The Environmental Permitting (England and Wales) Regulations (2007) which resulted in the revoking of large parts of The Waste Management Licensing (WML) Regulations (1994), The Pollution Prevention and Control (England and Wales) Regulations (2000) and the repealing of large parts of the Environmental Protection Act (1990) *inter alia*.

- After conducting the audits, key changes were proposed for the waste duty of care and waste carrier regimes (under The Controlled Waste [Registration of Carriers and Seizure of Vehicles Regulations] 1991, The Environmental Protection [Duty of Care] Regulations 1991 [as amended] and paragraph 12 of Schedule 4 and 5 of the WML Regulations [1994]).
- Because The Site Waste Management Plans Regulations (2008) were known about for some time, compliance audits were deferred until the regulations had been brought into place and Government guidance had been issued (the late nature of the aforementioned guidelines was considered when making compliance judgements).
- The biggest issue to affect the research has been the 2008-11 recession, resulting in a hasty Government spending review in 2010 and consequent austerity measures. This resulted in financial concerns and allocation of resources being a more significant factor in the final research conclusions than was anticipated.

3.4 Previous auditing experience

Compliance auditing methods and ideas were initially developed via a project financed by the European Regional Development Fund (ERDF) which was designed to contribute to meeting the objectives of the Regional (North West of England) Single Programming Document (2004) (SPD). The project was conducted at the Centre for Waste Management (CWM) at the University of Central Lancashire (UCLan) and ran from April 2004 – December 2006. Its aims were to assist SMEs in a range of environmental and waste disciplines, including environmental compliance. Although the initial research conducted does not form part of the final conclusions, many of the ideas for the research germinated during the CWM project and have been retrospectively built into the audit methodology presented here.

Part of the CWM project aimed to produce initial compliance data on SMEs by examining the findings from environmental compliance audits undertaken. The compliance audits considered a wide range of legislation but focused on 3 main regulations:

1. The Environmental Protection (Duty of Care) Regulations 1991 (encompassing section 34 of the Environmental Protection Act as amended);
2. The Control of Pollution (Oil Storage) (England) Regulations 2001; and
3. The Hazardous Waste (England and Wales) Regulations 2005.

The CWM project results are published in Wilson *et al.*, (2007).

The CWM project research cohort was based on SMEs recruited from a wide range of industries. Where possible, SME clusters were recruited so that data could be compared between and within sectors. In total, 36 SMEs participated in the study: 10 each from the printing, manufacturing and service sectors, 4 from the waste industry and 2 from food processing businesses. The SMEs were located within the eligible areas of the North and Western Lancashire Project boundaries; this constitutes 6 major areas: Preston, Lancaster, Adlington, Skelmersdale, Blackpool and Garstang in north Preston. Due to the nature of the

ERDF, the study areas are deemed to be amongst the least prosperous regions of the EU, although some areas were classified as “*in transition*”.

Environmental compliance audits and environmental reviews were conducted in each of the 36 SMEs. The audit process constituted a number of key stages as recommended by Moorman and Kirsch (1991). Firstly, after identification, SMEs were visited and an initial ‘SWOT’ (Strengths, Weaknesses, Opportunities and Threats) analysis was conducted (“*pre-audit*”). This involved a short discussion with management that allowed the terms of the project to be explained as well as for management to outline any known compliance issues.

The second stage (“*the audit*”) included an **observational** walk around the company’s premises. This was completed in the presence of management allowing informal discussion, questioning and the taking of photographs. The walk-around was followed by **documentation checks**; which included checks on: waste transfer notes, waste carrier licences, waste returns, consignment notes, consents to discharge, and waste/ environmental licences/ permits *inter alia*. In addition, **interviews** with key site staff (as suggested by Hillary, 2000 and Fairman and Yapp, 2005) were conducted with the aim of uncovering any recalcitrant activity.

The third stage (“*post-audit*”) included the diagnosis of company issues, translated through an ‘Action Plan’. The Action Plan was agreed with the company and was systematically implemented with CWM support.

Further research was conducted with 5 SMEs from the waste sector in order to develop a more sophisticated and holistic approach to compliance auditing (see Wilson and Williams, 2008). The follow-up research used a previously established methodology (Wilson *et al.*, 2007) as well as the use of regulation-specific (RSTs) and environmental offences audit templates (OTs) as well as interview questions for SME management and site staff. The audits mainly covered the organisation’s environmental permit (waste management licence at the time of the study) with other environmental legislation being considered holistically.

These audit features were incorporated into the 3 recognised stages of environmental auditing (i.e. pre-audit fact-find, audit [site visit and document reviews] and post-audit activities) as recommended by Moorman and Kirsch (1991) in order to gain a full picture of individual SME compliance.

The OTs were designed in addition to the RSTs so that where legislation was outcome focused (as often detailed in Acts of Parliament), offences could be determined in addition to where regulations were not met.

Interviews were conducted and recorded with a member of management as well as individual members of site staff. Interviews with management and site staff lasted approximately 1hr and 20 minutes respectively.

The additional research aimed to consider the impact and effectiveness of environmental legislation; how we might improve the environmental compliance control systems for SMEs as well as making recommendations for further research for the management of SME compliance.

Despite the author also having conducting compliance audits for a number of years, the use of robust interviewing techniques needed to be piloted and refined. As a result, test audits/ interviews were conducted with two businesses in order to review and refine the approach/

style. This resulted in the audit templates and interview questions being modified; in particular the questions to site staff were adjusted so that they are based around the types of paperwork they might produce or procedures they might follow rather than trying to determine specific knowledge of environmental legislation. The compliance audit templates were also refined so that they were appropriate for recording audit results *in-situ*.

Previous experience and piloting suggested that the management interviews should last approximately 1 hour and they should be recorded. The site staff interviews lasted approximately 20 minutes and due to work loads and other commitments it was best to conduct these *in-situ* (recording may not always be recorded). The SME interviews and audits were expected to take a combined total of 7-8 hours, although this reduced on smaller sites.

Other benefits of piloting included:

- It provided guidance on auditing different legislation - e.g. in order to audit waste activities and the completion of paperwork that had to be observed.
- It confirmed that if approached the right way, SMEs were happy to allow site photographs and photocopies of key documents to be taken.
- It helped develop the initial telephone fact-find and thus helped identify the right questions prior to the data collection on site as well as ensuring access to documentation and the most appropriate interviewees.
- It helped identify risk and ethical issues - managers were generally very receptive to the approach due to the advice they received while the process was taking place as well as receiving a compliance status report.
- It helped to refine the approach as it narrowed down the legal requirements as well as giving examples of what constituted compliance and non-compliance.

An established methodology has been published which includes general and specific compliance techniques for a number of the key pieces of environmental regulation studied. See Wilson *et al.*, (2008) for more information.

3.5 Methodology Limitations

A number of potential limitations were identified, these are set out below.

3.5.1 Confidentiality

Mistrust of the data collection process could have lead to biased or inaccurate information being given in interviews or unrepresentative situations being observed during audits. This was minimised via good auditing conduct; confidentiality was not compromised in an attempt to gather data. SMEs were not participating under duress; a telephone fact-find was conducted prior to data collection (see Appendix 1) and a follow letter was provided (see Appendix 2) setting out what was covered and how confidentiality was secured.

3.5.2 Sampling

Because SMEs were selected from a subsequent CWM project using non-probability sampling methods, it was initially felt that this might bias the results, however, the approach has been suggested as appropriate by Fink (2003).

It was not feasible to audit 100% of compliance evidence (i.e. a snapshot of compliance was taken – a 100% of the regulations were audited, but not 100% of the evidence); representative sampling was used so that a judgement could be made (e.g. a proportion of consignment notes were sampled from a range of dates).

The involvement of the CWM project was identified as a potential biasing factor (and to some extent the use of follow-up letters was also a biasing factor as detailed by Wink and Mokdad, 2005). This is because more socially conscious companies may participate in the project compared with those who make less effort to comply. After reflecting on the process, no bias was found because most SMEs saw it as a free service with nothing to lose rather than only those with good environmental management practices being interested in participating. Moreover, any other method (e.g. direct marketing) would have encountered similar issues unless audits were conducted under coercion from the regulator (which would have caused additional biases).

The size of the SME sample was heavily considered with concerns that 40-50 SMEs (planned participation levels) would not be sufficient, considering the total number of available SMEs. The sampling strategy is detailed in section 3.6; in Fairman and Yapp's (2005) study it was reported that 36-48 SMEs would give an accurate reflection of compliance issues for the regulations being covered.

3.5.3 Compliance Judgement

Consideration was given to what constituted 'compliance' and 'non-compliance' as research has shown that these were not always the opposite (see section 2.4). Because the research considered compliance with the 'spirit' as well as the 'letter' of the law it was important to be aware that just because a practice is not illegal does not mean that it is acceptable; therefore, consideration was given to anything that is not current good practice as well as that required in relevant approved codes of practice (ACoPs).

Due to compliance often being considered 'temporary' (Hutter, 1997), compliance audits should ideally be completed over a period of time to take into account these lapses, mistakes or on-going improvements. Even though this is important, it was recognised that there had to be an end point to the research - how long do companies get to be non-compliant before they are recorded as such?

Regulators' enforcement policies also differ for some of the regulations audited. Therefore, remembering that compliance is often considered to be that which is enforced by the regulator, it could be argued that some non-compliances were indeed compliant, (e.g. administrative offences [with no potential to cause environmental harm] are much less heavily enforced than those proven to cause environmental harm). To combat this and ensure consistency, each SME was judged against the legislation rather than relying on enforcement figures or practices for that region. It was also acknowledged that there will be an unavoidable individual level of uncertainty with the compliance results in each of the SMEs audited. This was reduced by ensuring each legal requirement is consistently interpreted based on guidance produced from the regulators (written guidance as well as that discussed during formal interviews), experience from previous research conducted and evidence from other practitioners.

Lastly, where compliance is based on a procedure being carried out (i.e. 'spirit' of the law), it was deemed important to question operational personnel so that information can be corroborated with documented evidence.

3.6 Methodology Approaches

The following methodological techniques were designed to fulfil the aims and objectives. Both qualitative and quantitative techniques were used, along with multiple data sources to ensure that the conclusions and recommendations were justified, consistent and reflective of the current legal performance of SMEs. A multi-method approach is supported by Corral-Verdugo (1997) who stressed the importance of using more than one method to obtain information about the same subject.

The above strategy manifested itself into two main methods:

1. Compliance auditing (incorporating site observations and document reviews); and
2. Interviewing (divided into 2 separate data sets), including, interviews with:
 - SME management and site staff; and
 - Regulators, policy makers and SME support organisations.

It was felt appropriate to use a case study format in which to research participating SMEs. This is supported by Bell (1999) who explained that it gives individual researchers an opportunity to discuss research problems in depth. Bell (1999) also points out that interviewing and observations are appropriate techniques when using case studies as the data set.

These methods are consistent with Williamson *et al.*, (2006b) and supported by Fairman and Yapp (2005); the latter of which used enforcement history, interviews with management and site inspections to give a professional judgement on compliance with health and safety legislation.

For clarity, the methods have been discussed according to each research aim, with specific objectives referred to as appropriate.

3.6.1 To determine and evaluate the level of compliance with environmental legislation in SMEs

The following objectives were designed to meet this aim: -

- To conduct environmental compliance audits with individual SMEs; investigating in particular, how they comply with the 'letter' and the 'spirit' of the law; and
- To determine SMEs' awareness and perception of environmental compliance.

The specific techniques employed are set out below.

3.6.1.1 Compliance Auditing

The compliance audits were designed to determine compliance with the 'letter' and 'spirit' of the law. These two facets were studied simultaneously. The 'letter of the law' was assessed objectively based on empirical evidence; whereby, each prescriptive part of each regulation was directly assessed. The 'spirit of the law' was assessed intuitively using cognition, by firstly deciphering what the intent of the legislation is and then judging whether the SME made an

attempt to comply with the aim of the legislation as well as meeting the specific conditions of the regulations. This objective derives from some businesses being accused of meeting legislative requirements (in terms of whether enforcement action can be taken) without actually achieving the aim of the legislation (this can be likened to complying with the conditions of the legislation, but not following any associated approved code of practice).

Sampling

As SMEs account for 99.7% of the 4.7 million businesses in the UK (National Statistics, 2007) (72.8% have no employees, with a further 18% having between 1-4 employees), the potential population sample for this study was enormous. It was decided to conduct a small number of detailed data-rich audits in the north-west of England in the expectation that a representative sample could be identified and thus the results would be indirectly applicable to the whole of the UK. Based on data from National Statistics (2007), 86.7% of the 4.7m UK SMEs were based in England with 9.5% based in the north-west alone [10.9% of England-only SMEs were based in the north-west]). The total north-west England SME population equates to 444,150 businesses (71% of which have no employees) (National Statistics, 2007).

The main focus was on those SMEs that are not part of direct regulator inspection regimes (700 PPC sites and a further 19,000 LAPPC sites are SMEs) but who because of their activities pose some environmental risk (i.e. business sectors that were purely administrative were excluded from the research). These industry sectors chosen included: - construction, manufacturing, hotel/ hospitality industry and the printing industry. SMEs from the waste industry were also chosen for comparison due to them being party to direct regulator inspection.

Table 3.1 shows the percentage of all industry types as distributed in the UK as a whole as well as in the north-west. Based on these figures and the targeted industries, a maximum of 46% of north-west based SMEs were eligible (i.e. 204, 309), however, this figure is expected to be considerably lower due to the grouping of SME types by National Statistics (e.g. recycling and printing are included within manufacturing).

Table 3.1 Industry-type distribution across the UK and north-west England

Industry Type	UK (%)	North West (%)	Targeted SMEs
A, B Agriculture, Forestry and Fishing	4	3	
C, D, E Mining & Quarrying; Manufacturing; Electricity, Gas & Water Supply	8	8	√ (8)
F Construction	21	20	√ (20)
G, H Wholesale, Retail & Repairs; Hotels & Restaurants	15	18	√ (18)
I Transport, Storage & Communication	6	8	
J, K Financial Intermediation (excluding turnover); Real Estate, Renting & Business Activities	26	23	
L, M, N Education; Health; Other	21	19	

Industry Type	UK (%)	North West (%)	Targeted SMEs
Services			
TOTAL SMEs	-	-	46%

Source: *Small Business Service 2001*

Due to the majority of these businesses having more than one employee a large percentage of potentially eligible SMEs were excluded from the sample; i.e. 71% of North West based employees have no employees, thus the total maximum potential SME population was approximately 59, 250.

A total of 44 SMEs were selected: 20 from the waste sector; 11 from manufacturing/ engineering; 3 from printing; and 5 each from the hotel/ hospitality and construction industries, respectively. This helped to ensure that a broad range of environmental legislation could be audited. This sample size is more than that assessed in similar published research (31 SMEs were studied in Williamson *et al.*, 2006b) and was deemed to be sufficient; this is supported by Fairman and Yapp (2005).

A non-probability sampling method called 'convenience sampling' was used (as outlined by Fink, 2003) based on databases held by the Centre for Waste Management (CWM) at the University of Central Lancashire and through other previously established waste industry contacts. This was deemed to be the most appropriate method because samples needed to be chosen based on judgement of the characteristics of the target population and the need for the research to be conducted within specific industry types. Probability sampling was not appropriate because of potential difficulties in obtaining cooperation from and in completing audits with all targeted businesses.

The selection of SME 'type' dictated the specific legislation to be audited. For example, construction companies were deemed likely to be obligated under The Site Waste Management Plans Regulations 2008. However, it was known that specific cross cutting legislation such as the Duty of Care in section 34 of the Environmental Protection Act would apply in all SMEs due to all businesses producing waste.

SME types

(i) The CWM Project

SMEs were located within the eligible areas of the North and Western Lancashire Project boundaries. This covered: Cumbria, central and eastern Lancashire and Greater Manchester. The CWM project funded the collection of data between April - September 2008.

The CWM project identified approximately 80 eligible SMEs from across the north west of England - a large selection of these were hand-picked and contacted by letter and were then followed up by telephone. Seventy-five percent expressed an interest in being involved in the study, primarily because there was no direct cost and a detailed report was provided free of charge. These leads were then forwarded to the author who contacted them to confirm their interest and to conduct a telephone fact-find (see Appendix 1). Audit dates were then programmed to suit the SME. SME availability was identified as a potential issue (e.g. the summer is a particularly busy period for hoteliers and the waste industry), therefore audits with these SMEs were programmed to avoid busy periods.

(ii) Additional SMEs

Additional SMEs were identified through other contacts made by the author; these primarily came from the waste management industry and were identified using non-probability sampling. In total, 20 waste SMEs were chosen to participate in the research. The types of waste SMEs included: transfer stations and recycling facilities, in-vessel composting facilities, WEEE storage and recycling sites, skip organisations, sewage sludge maceration and chemical distillation. Relationships had been established with individuals in these organisations previously, therefore, audits were programmed in as convenient.

Applicable Legislation

Table 3.2 outlines the legislation covered in the compliance audits. Statute legislation (i.e. Acts of Parliament) was assessed in general with applicable offences identified. Statutory legislation (i.e. Regulations) was specifically assessed against each applicable regulation. Although not all potentially applicable environmental legislation was included, it was felt that the number of regulations studied would give a good overall impression of legal performance.

Table 3.2 Legislation covered in the compliance audits

Legislation	Type of Audit
WASTE	
Environmental Protection Act 1990 (section 34)	General
The Environmental Protection (Duty of Care) Regulations 1991	Regulation-specific
The Hazardous Waste (England and Wales) Regulations 2005	Regulation-specific
The Producer Responsibility Obligations (Packaging Waste) Regulations 2007	Regulation-specific
The Packaging (Essential Requirements) Regulations 2003	Regulation-specific
The Waste Management Licensing Regulations 1994/ The Environmental Permitting (England and Wales) Regulations 2007	Regulation-specific
Control of Pollution (Amendment) Act 1989	General
The Controlled Waste (Registration of Carriers and Seizure of Vehicles) Regulations 1991	Regulation-specific
The Site Waste Management Plans Regulations 2008	Regulation-specific
The Waste Electrical and Electronic Equipment Regulations 2006	Regulation-specific
The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2008	Regulation-specific
WATER	
The Control of Pollution (Oil Storage) (England) Regulations 2001	Regulation-specific
Water Resources Act 1991	General
Water Industry Act 1991	General
The Groundwater Regulations 1998	Regulation-specific
AIR/ INDUSTRIAL POLLUTION	
Clean Air Act 1993	General
Pollution Prevention and Control Act 1999/ The Pollution Prevention and Control (England and Wales) Regulations 2000/ The Environmental Permitting (England and Wales) Regulations 2007	General and specific audits
Statutory nuisance under Part 3 of the Environmental Protection	General

Legislation	Type of Audit
Act 1990	
OTHER ENVIRONMENTAL LEGISLATION	
Town and Country Planning Act 1990	General

Data collection

The audits comprised of a number of phases - an initial fact-find, followed by the site visit which comprised of a document review and site walk-around. The document review consisted of reviewing mainly *primary* sources of information such as compliance records (e.g. waste transfer notes). Documentation was settled on a representative sampling basis to ensure that, where practical, compliance judgements were not based on limited documentation (as suggested by Bell, 1999). The site walk-around was principally used to gather practical information about how the site operated in relation to compliance requirements and/ or to corroborate documented procedures/ interviewee opinion. Photographs were taken (where permitted) to back up observations, interviewee comments and to support the writing-up of results.

The audit approach was chosen as this is a tried and testing method of gathering information about how a company operators. The auditing approach and style was adjusted to fit the study aims and objectives. This included the use of and further development of regulation-specific (RSTs) and environmental offences templates (OTs) (see Appendix 9). The RSTs and OTs were designed as a tool when conducting the audits (site walk-around and document reviews); additional, more detailed audit templates were used as a reference tool during the audit. The RSTs comprised of the regulatory requirements (with some guidance to assist identifying compliance) and the OTs detailed the potential offences from all the relevant legislation. The longer audit templates contained all the regulatory requirements and details of published statutory guidance.

The templates were used as a tick-box style tool during the audit with indications given on the templates whether the evidence would be identified by observation, by document review or both. Further information regarding the definition of compliance, audit scope, planning, conducting and reporting of audit results as well as supporting literature for the auditing approach used can be found in section 4.2.2 – Wilson *et al.*, (2008).

Methodology process flow

SMEs were recruited in a number of steps: -

1. Initial identification of SMEs from the CWM project and other contact databases (see SME database in Appendix 6).
2. Telephone conversation to confirm interest and to complete initial fact-fact (Appendix 1).
3. Follow-up letter confirming date of audit and details of approach (Appendix 2)
4. Completion of site audit and interviews (see section 3.6.1.2 and Appendices 7 and 8 and example RSTs and OTs in Appendix 9).
5. Follow-up report and letter provided to organisation (Appendices 3 and 4).

Results were recorded on individual RSTs and OTs during and immediately following the audits. The checklists were then used to develop the final compliance levels and to produce a compliance summary for the SME.

3.6.1.2 Interviewing

Aim one's second objective was to determine the awareness and perceptions of compliance with environmental legislation in SMEs as well as individual motivation to comply (i.e. fear of prosecution or simply altruism). This was achieved through a range of semi-structured interviews with senior management and site staff. Due to the type and amount of information discussed, face-to-face interviews were used (this is supported by Fink, 2003, Berg, 2004, Appleyard *et al.*, 2004 and Holbrook *et al.*, 2003), the latter of which stress that telephone questionnaires (in particular) affects the quality of the data compared to using face-to-face interviews. Fink (2003), Berg (2004) and Williamson *et al.*, (2006b) stressed that qualitative research is better when investigating social meanings, concepts and definitions, especially when there can only be probability, rather than certainty. This is illustrated by Kaplan who stated that: "*if you can measure it, then it isn't it*" (1964; 206).

Sampling

SME sampling is as set out in section 3.6.1.1. A further key issue was the selection of the most appropriate members of management and site staff. The interviews were designed to be conducted at the same time as the compliance audits and thus, SME management were primed on what to expect through the completion of the telephone fact-find (Appendix 1) (this also allowed screening to take place as recommended by Patton, 2002) and follow-up letter (Appendix 2). This is supported by Wink and Mokdad (2005) who stated that the use of advance letters help to eliminate non-response bias. Site staff were chosen on a relevancy basis; however, practically and economically this meant using non-probability sampling depending on staff availability (as supported by Fink, 2003).

The most appropriate people in terms of environmental management were chosen to take part in the interview. This contrasted that reported in the Atkins (2007) Netregs business survey methodology where only 1% of those interviewed was the environmental manager. Cross-cutting semi-structured interviews were conducted with various levels of management and site staff. However, due to there not usually being a set position for SME management/ compliance, the managing director was interviewed as well as any other staff that had an environmental/ compliance management role or responsibility. These interviews allowed a range of staff opinions and perceptions to be identified and thus an overall discernment could be made about the SME's compliance. The key objective for the interviews was for them to be completed with the most relevant people so that all the necessary information could be gathered to make a full evaluation of compliance.

Data collection

The interviews with senior management lasted approximately 1 hour. The interviews were conducted on a topic-by-topic basis (semi-structured as described by Berg, 2004) rather than using a strict prescriptive questionnaire approach (this approach is supported by Fairman and Yapp, 2005b and Almond, 2006). An interview prompt sheet was used which included details of the legislative requirements and the key regulatory content which needed to be discussed as well as regulatory indicators the interviewee needed to be aware of (Appendices 7 and 8). This

enabled an assessment to be made of their underpinning knowledge and understanding and consequently, went some way to determining the overall compliance of the SME. Interviewees were provided with an interview information sheet (rather than an advance copy of the questions due to knowledge being a determinant of the interview) as recommended by Oishi (2003) and Fink (2003) (see Appendix 10). Respondents were also given the opportunity to check interview transcripts once written up; however all were happy for the interviews to be recorded and none requested to see the verbatim transcripts.

Interviews with other members of staff were less detailed and were generally conducted after the interviews with senior management. As well as gaining their thoughts and opinions, they were used to verify the procedural information received from senior management as well as to gain an understanding of site staff's knowledge and understanding. As some site staff were only involved in minor areas of environmental compliance, it was deemed acceptable to get several members of staff to contribute to a single interview script (although not at the same time).

The interview questions were designed around the specific regulations audited as well as around the set objectives - i.e. how do SMEs' operate and what knowledge, attitudes and opinions do they have? Additional procedural questions derived out of the regulatory questions as appropriate as it was necessary to find out how SME's comply, their knowledge and understanding and how this fits into SME compliance with the letter and spirit of the law. Interviewees were asked to explain the procedures that fulfill the requirements of the regulations, however, due to many site staff often lacking procedural knowledge this proved difficult.

The regulation-specific interview questions were targeted at both senior management and site staff. For example, when focusing on the Duty of Care for waste, interviewees were asked general questions (e.g. what they know about the legislation and what it means to be compliant) as well as specific questions (e.g. how long should a waste transfer notes be kept). Follow-up questions were asked as appropriate.

Where interviewees did not know the answer, 'probes' were used to try and stimulate a response; where used these were recorded on the interview transcripts. A potential issue to the 'lack of knowledge' may have been that the question was not understood. This was identified at the initial piloting stage as suggested by Presses *et al.*, (2005) by asking respondents "*what they thought the question meant*". This allowed questions to be neutralised, made non-complex (as supported by Fink, 2003), standardised (as supported by Oishi, 2003) as well as identifying where the use of "*cop speak*" was necessary (as described by Berg, 2004). Oishi (2003) also supports the use of language that is relevant to the 'population', so that the interviewee feels comfortable and so that their responses were not limited through the use of technical language.

The following interview procedure was followed:

- Interviewee was thanked for participating;
- Interviewees were asked if they were happy for interviews to be recorded (only relevant to interview with SME management due to the *in-situ* nature of the site staff interviews making recording difficult). This was so they could be accurately transcribed off-site (allowing accurate data storage and retrieval as suggested by Berg, 2004);
- It was explained that hand written notes would be taken as a back-up (apologies were made for any delays but it was important that opinions are recorded accurately, as suggested by Patton, 2002);

- It was explained that interviewees were free to stop at any time etc...;
- It was explained that interviewees can be provided with a copy of the transcripts if they wish to confirm the contents;
- Interview number was stated, along with the date, time, name of interviewee and name of company;
- Interviewees were provided with an information sheet (Appendix 10);
- It was explained that the digital recorder would be tested prior to starting the interview (as suggested by Patton, 2002); and
- It was explained that question numbers would be stated prior to asking each question.

It was important not to be influenced by previous interviewing experience as this was identified as a biasing factor (especially as the number of interviews progress) by Olson and Peytchev (2007). This was addressed through initial piloting (see section 3.4) as well as reviewing interview protocol intermittently by reviewing transcripts and thus identifying potential bad habits or evidence of rushing or leading the interviewee (the use of cognitive interviewing or pre-testing is also supported by Beatty and Willis (2007) and Fink (2003).

3.6.2 To evaluate the impact and effectiveness of environmental legislation in SMEs

The second aim investigated the 'successfulness' of environmental legislation from a number of perspectives. The methodological approach was similar to that explained in section 3.6.1; however, specific questions and observations were included in order to specifically address the project objectives.

The following objectives were set to meet this aim:

- To analyse, compare and contrast the implementation of environmental legislation, based on SME, regulator and policy maker experience;
- To analyse, compare and contrast the enforcement action as a result of non-compliance, based on SME, regulator and policy maker experience; and
- To determine if environmental compliance results in improved environmental protection and vice versa.

The above objectives have been achieved through the completion of compliance auditing and interviews. The specific techniques employed have been set out below.

3.6.2.1 Interviewing

The first and second objectives (covering the implementation and enforcement of environmental legislation) were achieved through the interviews.

Sampling

Sampling was as set out in section 3.6.1.2; the questions covering the impact and effectiveness of environmental legislation were included within the same interview.

Data collection

The general elements covered in section 3.6.1.2 are relevant here, in addition to the following line of questioning.

Within the SME management and site staff interview questions, sections 2 and 3 of the interview scripts are relevant (see Appendices 7 and 8). This stage of the interview was focused on assimilating opinion rather than determining understanding.

The questions focused on the implementation of environmental legislation:

- The overall perception of how environmental regulation is implemented in the UK as well as in SMEs;
- Timescales for implementation of environmental legislation;
- Implementation assistance and guidance provided;
- Inspection frequencies for SMEs;
- The perception of the successfulness of environmental legislation in achieving its aims;
- Specific implementation questions about the regulations studied;
- Specific questions relating to how SMEs prove compliance (i.e. the paperwork they may need to complete);
- Specific questions about SMEs' ability to comply, e.g. proportionality of legislation;
- Issues SMEs are aware of (experiences they have had) in the implementation of environmental legislation;
- How regulation could be better implemented in SMEs;
- The type of regulations; which is easier to comply with – prescriptive or goal based?
- Does more stringent regulations result in better protection for the environment?
- What is understood by 'better regulation': better implementation, less regulation or more stringent enforcement; and
- Is compliance considered onerous in relation to the potential pollution it may prevent?

Secondly, the questions focused on the enforcement of environmental regulations:

- The overall perception of how environmental regulation is enforced in the UK as well as in SMEs;
- What enforcement action has been taken against SMEs;
- How each group sees environmental compliance in SMEs;
- How each group feels environmental non-compliances are enforced;
- How each group sees the successfulness of the EA's enforcement policy; and
- Specific enforcement questions about the environmental regulations studied.

Separate interviews (the same line of questioning) also took place with representatives from environmental regulators and from government policy makers so that a comparison can be drawn, fulfilling the principle of triangulation.

Interviews were held with:

- The EA (policy writers, an enforcement officer and waste packaging specialist)
- North-west local authority enforcement officers
- North-west local authority planning departments
- Lancashire Trading Standards Officers
- Defra – SWMP policy writer
- Defra – waste duty of care/ waste carrier regime policy writer
- Defra – hazardous waste policy writer
- The Local Better Regulation Office (LBRO)
- Local Authority Coordinators of Regulatory Services (LACORS)

- United Utilities enforcement officers
- National Measurement Office (NMO) policy writers
- Business Link small business adviser
- The Federation of Small Businesses small business adviser
- The Chamber of Commerce small business adviser

Where time permitted and interviewee fatigue was not a factor, additional questions were asked in section 4 of the interviews (see Appendices 7 and 8). They sought opinion in terms of whether environmental legislation provided improved environmental protection and will be used to support that identified by the audits (see section 3.6.2.2 below).

3.6.2.2 Compliance auditing

The third objective (to determine if compliance results in improved environmental protection) was achieved through the audits.

Sampling

Sampling is as set out in section 3.6.1.1; the issues investigated were included within the audit process previously discussed.

Data collection

The general elements covered in section 3.6.1.1 were relevant in addition to determining whether compliance results in improved environmental protection.

Two sets of templates were used to support data collection:

1. The RSTs and OTs (Appendix 9) were used to record evidence of environmental pollution or damage caused through poor management and/ or negligence.
2. The audits sought to link the issues in the legislation with environmental improvement or environmental damage prevention measures which were then observed in practice. These were then cross-referenced and a judgement made as to whether compliance could be linked to environmental protection. As suggested by Rabi *et al.*, (2008), the methodology includes consideration of impact pathway analysis as well as SME perception.

The audits were used to decipher whether compliance with certain regulations provides a higher level of protection for the environment as well as providing some insight into whether more established regulations have higher compliance levels.

Where no obvious adverse environmental impact is identified, the potential pollution risk was considered (where this might lead to a future environmental impact). A number of tools were used, including the EA's CCS and CICS as well as information retrieved from the Remas project (2006) (as described in section 2).

The EA has an on-going programme of auditing for industrial installations, the results of which are used to compile site 'compliance assessment plans' (CAPs). These enable the EA to target those operators with low performance ratings and subject them to more audits, which in turn affects the charges to be levied.

The EA's CCS was introduced in April 2004 and aims to ensure more consistency in assessing non-compliance with permit conditions and subsequent potential environmental impact, and thus enforcement action. The four categories of non-compliance and normal prosecution response are: -

- CICS 1 - potential major environmental effect - normal response will be prosecution
- CICS 2 - potentially significant environmental impact - normal response will be formal caution or prosecution
- CICS 3 - potential minor environmental impact - normal response will be a warning
- CICS 4 - no potential environmental impact - normal response will be a warning

A site's CCS score is used to assess its overall score under 'Opra', which in turn affects the amount of regulatory attention received and thus fees and charges to be paid.

For the purpose of the methodology, 'environmental protection' means preserving or protection from the harm of pollutants. Under Part 1 section 1(3) of the EPA (1990) "*Pollution of the environment*" means pollution due to the release (into any environmental medium) from any process of substances which are capable of causing harm to man or any other living organisms supported by the environment. Key pollution outputs will include: air emissions, water pollution, land contamination, waste management issues and local eyesores (i.e. fly-tipping).

3.6.3 To evaluate and improve the environmental compliance control systems in SMEs

The third aim investigates the current SME compliance control system in the UK - evaluating the link between the EA assessments and the enforcement of 'other' environmental legislation. The key objectives from this aim were to improve the current system, including developing:

1. An initial environment risk assessment methodology; and
2. Environmental compliance performance indicators for SMEs.

This aim was partially fulfilled through completion of site audits as well as through interviews with SME management and site staff as outlined in sections 3.6.1 and 3.6.2. However, specific additional approaches were used and have been outlined below.

3.6.3.1 EA Compliance assessments and the control of 'other' environmental legislation in licensed/ permitted sites

An evaluation of the EA Compliance Assessment Report (CAR) system was achieved through the completion of site audits on 20 waste management sites controlled under The Environmental Permitting (England and Wales) Regulations, 2007 (The Waste Management Licensing Regulations 1994 at the time).

Sampling

The same sampling process was followed as in section 3.6.1.1; the issues were included within the same audit process.

Data collection

The general elements covered in section 3.6.1.1 are also relevant here as the additional audits were identical, except that they included environmental permit conditions. In order to fully evaluate the current compliance control system, an assessment of the EA's inspections was also conducted based on an analysis of assessment reports and discussions with SME management and site staff as well as through interviews conducted with EA regulatory officers. This allowed cross-referencing with the audits to identify discrepancies as well as to assess whether the EA's audits are adequate in terms of controlling compliance with non-environmental permitting regulation conditions. This also involved an assessment of what the EA considered to be a 'non-compliance', especially since the 'actual' dictionary definition can be different to the non-compliance prosecuted (EA, 2008).

The above objective was also discussed in section 5 of the interview questions with SME site staff and management (see Appendices 7 and 8).

3.6.3.2 Initial Assessment Methodology

This objective derived from the idea that sites that are not party to any permitting regime are not as frequently inspected (if it all). As a result, compliance with environmental legislation is to a large extent unknown and thus the compliance control system may not be adequate.

In order to evaluate the risks associated from non-permitted sites, this objective was designed so to create an initial assessment methodology and thus decisions can be made as to the adequacy of the current controls.

The true extent of the need for the initial assessment methodology derived out of the audits and interviews as described in section 3.6.1 and 3.6.2. The assessment methodology was devised as a direct result of risk analysis conducted during the compliance audits and is a key output from the study.

It was acknowledged that the assessment methodology may widen the scope of what is meant by 'risky' industries/ businesses and uses a range of environmental criteria to establish whether a business is considered an environmental risk. It was initially intended that environmental criteria will incorporate similar criteria to that used by the EA's Opra scheme, however may be weighted differently. It was not intended for this objective to lead to the roll out of inspections to all businesses.

This objective was also discussed in section 6 of the interview questions with SME site staff and management (see Appendices 7 and 8).

3.6.3.3 Environmental compliance performance indicators for SMEs

This objective was achieved through the completion of the other study objectives. Prior to data collection, it was decided that these indicators need to be regulation-specific and quantifiable, although some general indicators will apply.

It was anticipated that two levels of indicators will be used; those which 'directly' relate to regulatory compliance can thus act as a kind of 'litmus test' for environmental compliance and

those which 'indirectly' relate to regulatory compliance; something which is not directly required by law but which indicates compliance.

It was anticipated that these indicators can be used by both regulators, as part of their inspection system and by SMEs to assess their own performance.

The objective was also discussed in section 6 of the interview questions with SME site staff and management (see Appendices 7 and 8).

3.7 Data Analysis

3.7.1 Audit data

An individual table was created for each regulation and summarised by sector. Results were presented to show overall compliance by regulation and sector (e.g. construction). In general, compliance scores of less than 40% were deemed to be 'low', scores between 40-70% were deemed to be 'medium' or 'moderate' and scores above 70% were deemed to be 'high'. Consideration was given to the *median* and *mean* scores for the individual regulations as well as for overall compliance for each SME. It was decided to base it on the level of expected compliance rather than on a range either side of the *median* (compliance was too low and the sample was not large enough to base it on the *median*). Where compliance scores were low in all SMEs audited, a conclusion can be made about the overall state of the regulation rather than measuring SMEs relative to their peers.

High level statistical analysis was conducted using Kruskal-Wallis to analyse the results and compare compliance between sectors; each individual SME's compliance score was used as a data point to compare with other sectors. The results are presented in Appendix 13. Kruskal-Wallis is a non-parametric test used to compare three or more samples. It is used to test the null hypothesis that all populations have identical distribution functions against the alternative hypothesis that at least two of the sample's medians differ.

The Kruskal-Wallis test is the non-parametric equivalent to the one-way analysis of variance. Assumptions for the test are that within each sample the observations are independent and identically distributed and the samples are independent of each other. If the p-value is less than the specified level (0.05), then there is evidence to suggest that at least one of the population medians differs from the others.

The Kruskal-Wallis hypotheses are:

- H0: the population medians are all equal; versus
- H1: the medians are not all equal.

A standard deviation test was also used to measure the difference in the number of obligations affecting each SME in each sector. The results are presented in Appendix 13.

3.7.2 Interview data

Content analysis or identification of emergent themes was the primary method of interpreting interview findings. Interviews were recorded with all SME managers and a number of SME site staff. Due to the majority of the policy holder, regulator and SME support organisation interviews being conducted over the phone, they were not recorded. Because transcribing interviews verbatim is time-consuming, recordings were transcribed (where possible) soon after they were conducted. This allowed themes to be built up over time, without them being formalised until all interviews were written-up. This avoided a back-log of interviews to be transcribed and ensured all data was appropriately managed (a warning made clear by Hardy and Bryman, 2004).

Analysis was primarily topic-orientated, with emerging themes being identified from the data, listed separately under each interview heading and managed in relation to its source and context (as suggested by Hardy and Bryman, 2004 and Bell, 1999). Themes were then grouped by cohort (i.e. SME management, site staff, policy holders, regulators and SME support organisations) and compared with other data sets. Information about the user (i.e. "list" questions) was tallied so that data could be gathered on them and their company's background; this was then used to identify if patterns existed due to the age, experience (etc) of the interviewee.

Given the small but rich data set, it was not deemed appropriate to apply computer-based statistical analysis. Whilst there are many merits to the use of statistics, it is sometimes seen as a *different* way of doing things, rather than a *better* way (Hardy and Bryman, 2004).

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The Producer Responsibility Obligations (Packaging Waste) Regulations 2007. SI 2007, No. 871, HMSO, London.

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Wilson, C, D, H; Williams, I, D; Mair, N and Lowe, C, N (2007). *Environmental Compliance in Small and Medium-Sized Enterprises: Experiences from the North West of England.* Communications in Waste and Resource Management, **8(2)**.

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CHAPTER 4

RESULTS

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4.1 Results

In total, 44 compliance audits (incorporating document reviews, interviews and site audits) were conducted as set out in Table 4.1. An excerpt of the database used to manage the SMEs is contained in Appendix 6.

Table 4.1 Compliance audits conducted by SME sector

SME Sectors	Number audited
Construction/ demolition	5
Manufacturing	11
Hotels	5
Printing	3
Waste	20
TOTAL	44

In total, interviews were conducted with 99 individuals, including:

- 44 SME managers;
- 34 site staff;
- 2 EA managers and 1 enforcement officer;
- 4 local authority enforcement officers;
- 1 National Measurement Officer policy writer;
- 1 United Utilities enforcement officer;
- 2 Trading Standards Officers;
- 4 Defra policy writers; and
- 6 from support organisations, including the Chamber of Commerce (CoC), The Local Better Regulation Office (LBRO), Business Link, The Federation of Small Businesses (FSB) and The Local Authorities Coordinators of Regulatory Services (LACORS).

The characteristics of the SMEs studied are detailed in Tables 4.28-33 of section 4.2.8. Analysis shows that:

- The vast majority of management (93%) and site staff interviewees (97%) were between the ages of 25-64 (Table 4.28).
- Almost 82% of SMEs employed up to 49 staff showing that the vast majority of SMEs were in the 'small' to 'micro' category (Table 4.29).
- Sixty-four percent of SMEs had a turnover of between £0-2m, with the remaining 36% being shared between businesses with a turnover of between £2-5m and £5-20m (Table 4.30).
- Forty-one percent of SMEs were established >10 years and 36% had been established between 2-10 years (Table 4.31).
- Ninety-five of SME management and 65% of site staff had Internet access (Table 4.32).
- Fifty-five percent of SME management and 35% of site staff had some prior environmental experience (Table 4.33).

4.2 Published work

In total, 9 papers have been published. These have been presented in chronological order and include a brief synopsis. The results of the data generated during the PhD candidature and that which forms the discussion and conclusions in Chapters 5 and 6 is contained in sub-sections 4.2.5 - 4.2.9. The individual papers are listed below:

4.2.1 Wilson, C, D, H; Williams, I, D; Mair, N and Lowe, C, N (2007)

Environmental Compliance in Small and Medium-Sized Enterprises: Experiences from the North West of England. Communications in Waste and Resource Management, Volume 8, Issue 2, 76-86.

4.2.2 Wilson, C, D, H; Kemp, S and Williams, I, D (2008)

A methodology for assessing environmental compliance in small to medium-sized enterprises. In Townshend, M. (Ed): Proceedings of Waste 2008- Waste and Resource Management – A shared responsibility. Stratford-upon-Avon, 16-17 September, 127-136.

4.2.3 Wilson, C, D, H and Williams, I, D (2008)

Environmental compliance in small- and medium-sized enterprises. Proceedings of the CIWM Annual Conference, 10-13 June 2008, Paignton, Conference Session 9, Paper 2.

4.2.4 Wilson, C, D, H; Williams, I, D and Kemp, S (2008)

Using risk assessment mechanisms to regulate legislative compliance in SMEs. In Townshend, M. (Ed): Proceedings of Waste 2008- Waste and Resource Management – A shared responsibility. Stratford-upon-Avon, 16-17 September, Session 4, 137-148. The Waste Conference Ltd, Stanton-on-the-Wolds, UK. ISBN-10: 0-9539301-4-9

4.2.5 Wilson, C, D, H; Williams, I, D and Kemp, S (2009)

Compliance with water legislation in waste management facilities: Experiences from UK small and medium sized enterprises. Proceedings of the Twelfth International Waste Management and Landfill Symposium. S. Margherita di Pula, Cagliari, Sardinia, Italy, October 5/9. Paper No. 354. ISBN 978-88-6265-007-6.

4.2.6 Wilson, C, D, H; Williams, I, D and Kemp, S (2010)

Compliance with Producer Responsibility Legislation: Experiences from UK Small and Medium-Sized Enterprises. Business Strategy and the Environment. DOI: 10.1002/bse.698.

4.2.7 Wilson, C, D, H; Williams, I, D and Kemp, S (2011)

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This paper outlines the initial results from compliance audits conducted during a 2-year European Regional Development Funded (ERDF) project that provided specialist support to SMEs in the North West of England. The paper uses practical experiences from the project to reveal some initial findings on compliance with 3 pieces of environmental legislation. This research contributed to the development of the compliance auditing methodology approach outlined in the research (see section 4.2.2 and Chapter 3 for further information).

Results suggest that compliance levels in SMEs are extremely poor and that a regulation-specific approach to auditing is an effective way of determining legal performance in SMEs.

See below for an edited copy of the paper.

Environmental Compliance in Small to Medium-Sized Enterprises (SMEs): Experiences from the North West of England

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Abstract

Environmental compliance should be at the heart of sound environmental and business performance. However, anecdotal evidence and prior experience reveal that compliance is one area that is often thought of as bureaucratic and a hindrance to competitiveness, especially amongst Small to Medium-sized Enterprises (SMEs).

This paper describes a 2-year European Regional Development Funded (ERDF) project that provided specialist support to SMEs in the North West of England. The project aimed to optimise business opportunities for SMEs by improving compliance with environmental legislation, developing greater awareness and knowledge of environmental issues and enhancing overall environmental performance.

The paper uses practical experiences from the project to reveal some initial findings about environmental compliance in SMEs. Results suggest that compliance levels in SMEs are poor and that a regulation specific approach to auditing is an effective way of determining legal performance in SMEs.

Keywords: Auditing, compliance, environmental law, SMEs.

Introduction

See section 1.1 for an introduction to the subject.

Purpose of this study

The project described in this paper was funded by the European Regional Development Fund (ERDF) and was designed to contribute to meeting the objectives of the Regional (North West of England) Single Programming Document (2004) (SPD). The project was led by the Centre for Waste Management (CWM) at the University of Central Lancashire (UCLan), in partnership with the Central and West Lancashire Chamber of Commerce and Industry and Nimtech Limited. The project ran from April 2004 – December 2006 and its aims were to assist SMEs in a range of environmental and waste disciplines, including legal environmental compliance. The project supported businesses in areas such as environmental policy, environmental management systems and legislative compliance as well as developing collaborative links between SMEs.

The study aimed to produce initial compliance data on SMEs by examining the findings from environmental compliance audits undertaken as part of the ERDF project. The compliance audits considered 3 main regulations: The Environmental Protection (Duty of Care) Regulations 1991 (encompassing section 34 of the Environmental Protection Act); The Control of Pollution (Oil Storage) (England) Regulations 2001 and The Hazardous Waste (England and Wales) Regulations 2005.

Methodology

The research cohort for this study was based on recruited SMEs from a wide range of industries. Where possible, SME clusters were recruited so that data could be compared

between and within sectors. In total, 36 SMEs were used in the study: 10 each from the printing, manufacturing and service sectors, 4 from the waste industry and 2 from food processing businesses. The SMEs were located within the eligible areas of the North and Western Lancashire Project boundaries. In terms of the geographical regions, this constitutes 6 major areas: Preston, Lancaster, Adlington (near Chorley), Skelmersdale, Blackpool and Garstang in north Preston. Due to the nature of the ERDF, the study areas are deemed to be amongst the least prosperous regions of the EU, although some areas are classified as “*in transition*”.

Environmental compliance audits and environmental reviews were conducted in each of the 36 SMEs. The audit process constituted a number of key stages as recommended by Moorman and Kirsch (1991). Firstly, after identification, SMEs were visited and an initial ‘SWOT’ (Strengths, Weaknesses, Opportunities and Threats) analysis was conducted (“*pre-audit*”). This involved a short discussion with management which allowed the terms of the project to be explained as well as for management to outline any known compliance issues.

The second stage (“*the audit*”) included an **observational walk** around the company’s premises. This was completed in the presence of management which facilitated informal discussion, questioning and the taking of photographs. The walk-around was followed by **documentation checks**; which included checks on: waste transfer notes, waste carrier licences, waste returns, consignment notes, consents to discharge, and waste/ environmental licences/ permits *inter alia*. In addition, **interviews** with key site staff (as suggested by Hillary, 2000) were conducted with the aim of uncovering any recalcitrant activity.

The third stage (“*post-audit*”) included the diagnosis of company issues, translated through an ‘Action Plan’. The Action Plan was agreed with the company and was systematically implemented with CWM support.

Results and Discussion

Compliance with The Control of Pollution (Oil Storage) (England) Regulations 2001

Out of the 36 SMEs assessed, half were required to comply with the regulations. Although SME category wasn’t significant in determining whether they were bound by the regulations, more of the smaller SMEs were able to take advantage (inadvertently in most cases) of the “*storage capacity of 200 litres or less*” exemption in the regulations.

Table 4.2 shows how the different requirements of the regulations were broken down for the purpose of the audit as well as compliance results by sector and overall compliance with the regulations.

Results show that compliance with the regulations was reasonably high except for the requirements relating to ‘secondary containment (bundling) for containers’ (50% compliance) and ‘containment (drip trays) for ancillary equipment’ such as fill pipes (33%). Compliance scores for ‘bund wall impermeability’ were inevitably low (50%) as containers with no bunding were automatically given a fail. Encouragingly, 100% of those containers with bunding were deemed to be adequate in terms of impermeability.

Overall the auditing process indicated 78% compliance with individual components, with only moderate variations in compliance scores for each sector, varying from 72% compliance in the

waste industry to 83% in the service sector. However, these results should be interpreted with caution as high scores (i.e. bund impermeability) may distort lower scores (i.e. secondary containment) and give an overall false impression that compliance was relatively high when actual compliance varied greatly within the regulations.

A significant issue identified by the audits was related to both management and staff's poor awareness of the legislative requirements, with the majority of the affected SMEs not aware of the existence of regulations and even fewer aware of the general requirements which ensured compliance. SMEs were generally aware that oil was a dangerous pollutant with some aware that storage tanks had to be banded, however, few had a working knowledge of the regulations nor were they able to confidentially confirm whether they were complying.

When questioned about the regulations, most thought that since they only stored a few drums (205 litres) then the regulations would not apply to them. One manager tried to argue that his 500 litre container never contained more than 200 litres of oil, despite the regulations relating to the size of the container and not the amount of oil stored within that container.

An important requirement (and the worst offender in terms of non-compliance) was the provision of 'secondary containment'. The regulations state that for containers (other than drums) the secondary containment must be of sufficient capacity to contain 110% of the total volume of the container. Where more than one container is stored in the secondary containment, it should be capable of holding 110% of the largest container or 25% of the total, whichever is the greatest. For one drum, the secondary containment should be 25% of the drum's capacity or if more than one drum is in the system it should be capable of holding the aggregate storage capacity of the drums. Of those SMEs affected, many thought that double skinned tanks provided adequate secondary containment, however, it had to be explained that this is not the case as these tanks do not prevent escape of oil if the tanks is overfilled for example. Moreover, the inappropriate use of the bund as a storage area for equipment and tools negated its use in several instances and thus had to be recorded as non-compliant.

There were also issues concerning the definition of oil, with SMEs, when questioned, unaware of what constituted oil in the regulations; on several occasions many SMEs seemed to anticipate that what they stored wouldn't be covered by the regulations rather than seeking clarification.

Another issue concerned interpretation of the term 'storage', with one SME in particular claiming that the oil was in use rather than being stored and thus was not covered by the regulations (i.e. wrongly comparing their case to how fuel in vehicles is not covered by the regulations).

Lastly, the use of a building as a secondary containment unit was questionable. Those SMEs that were broadly aware of the regulations felt that any storage of oil inside a building exempted them from the regulations. However, it was evident on several occasions that the building used to store oil was not suitable to be described as secondary containment nor had it been adequately risk assessed for that purpose.

Compliance with The Environmental Protection Act 1990 (EPA) (section 34) (as amended) and The Environmental Protection (Duty of Care) Regulations 1991 (DoC) (as amended)

Out of the 36 SMEs assessed, all were obliged to comply with these regulations such is the cross-cutting nature of waste generation. Only those SMEs operating in the waste industry were

not the initial waste producer; the 4 audited waste companies operated as both waste carriers as well as waste management licence holders, therefore, they had slightly different positions in the waste chain compared to other SMEs.

Table 4.3 shows how the different requirements of the EPA and the DoC regulations were broken down for the purpose of the audit as well as overall compliance results by sector and overall compliance with the regulations. Results showed that compliance with the EPA and the DoC regulations was poor with compliance levels of 22% and 28% respectively.

With regard to compliance with the EPA, the requirement “*to prevent any contravention by any other person of section 33*” was not able to be fully and accurately measured due to the scope of the audit not including assessment of each load from ‘cradle to grave’. However, it was felt that on certain occasions, the storage (keeping) of waste by certain SMEs could potentially lead to others breaching section 33(1)(c) – i.e. “*a person shall not treat, keep or dispose of controlled waste in a manner likely to cause pollution of the environment or harm to human health*”.

In terms of the requirement “*to prevent the escape of waste*”, the audits identified several breaches, with a wide range of compliance scores across the SME categories. As expected, those industries handling the largest amounts of waste scored the lowest as there were more opportunities for mistakes to be made (25% compliance in the waste sector compared to 90% in the service sector). The non-compliances identified manifested themselves as leaking bags of waste, unsheeted skips and damaged storage containers.

The requirement to ensure that waste “*is transferred to an authorised person or for authorised transport purposes*” was not well met with only 25% of SMEs complying when sampled. Managers were more aware of the requirement for waste carriers to be registered than they were of what information needed to be provided on a waste transfer note. Regardless of this, audits showed that many SMEs failed according to the legislation to “*secure*” this matter and thus in many cases presumed that carriers were registered. Checks were made of the carriers collecting waste and all were registered with the Environment Agency, however, very little effort was made to secure this fact (i.e. carrier registration numbers provided on WTNs was not seen as adequate to confirm compliance). SMEs in the waste sector were the most compliant with this requirement, with all 4 able to provide copies of registration certificates under the Control of Pollution (Amendment) Act 1989.

In terms of the final condition of the EPA (production of transfer note), on 72 transfers sampled (2 from each SME) 54% had a transfer note ‘available’ (39 out of 72). In terms of the actual number of waste transfer notes (WTNs) produced for each transfer, this would have been higher if the audit had just taken into account the number of WTNs ‘produced’ compared to those which businesses were able to make ‘available’ a period of time after the transfer. This matter is reflected in the percentage of sites capable of demonstrating retention of transfer notes for 2 years as required by the Duty of Care Regulations, 1991.

Markedly lower compliance scores were given here than for any other requirement of the EPA (overall score of 4%) due to the fact that the majority of the written descriptions were insufficient and thus would potentially not enable other persons to avoid a contravention of section 33 or with respect to the escape of waste, a result corroborated by Bland *et al.*, (2004).

The DoC regulations compel the transferee and transferor to produce and sign a WTN; the main issue here is whether the WTN was signed by both parties when the transfer took place. Of the

72 deposits transferred, 36% (26 of 72) were deemed to be compliant revealing the fact that many WTNs went unchecked when waste was transferred.

In terms of identifying the waste, no significance can be attributed to any sector because a large percentage of WTNs were completed by the waste carrier rather than the producer of the waste; this was a common occurrence across all sectors. Overall, sites were poor at identifying the waste according to the correct European Waste Classification (EWC) code, with only 19% of sites complying overall. These poor scores were attributed to a number of non-conformances, including, failure to use EWC codes at all and incorrect use of codes as well as failing to identify ALL significant codes on the WTN.

SMEs did not comply well with the obligation to specify the quantity of waste (22% in compliance), those who did make an effort, tended to specify broadly, such as to say “1 skip full” rather than an estimation of volume or weight.

The obligation to state whether the waste was containerised or loose was poorly met. Where WTNs were deemed to be complaint (8%), this was due to descriptions of waste (mainly for invoicing purposes) mentioning that the waste was transferred in a certain size of skip.

When “*stating the time and place of transfer*,” SMEs had to fulfill both requirements to show compliance and as no WTNs stated the time of transfer every WTN was recorded as non-compliant with this aspect. It was envisaged that only those transferring waste via a weighbridge would have completed this requirement as documentation usually contains the time/date the load was weighed.

Of the WTNs that were available, most included the name and address of the transferor and transferee (36 out of 39) with every WTN stating whether the transferor was the producer or the importer (39 out of 39). However, just under half of WTNs were not produced or available during the audit (46%).

All assessed WTNs were derived from transfers between producers and waste carriers on the site of production. Therefore, the applicable transferor and transferee category of the sites audited included the identification of the transferee as a waste carrier under section 2 of COP(A)A (1989) as well as the provision of the Environment Agency registration number. Of those required, the vast majority of the WTNs identified who the carrier was, however, much fewer included details of the waste carrier’s registration number; this resulted in lower overall compliance (22%), although it was marginally higher in the waste sector (38%).

Lastly, each site was assessed individually when auditing the stipulation to keep WTNs for 2 years from the date of transfer. Results showed that only 10 of 36 sites (28%) could meet this requirement; it should be noted that the waste sector performed the highest score (75% compared to 5% in the printing and manufacturing industries). When assessing only those WTNs which were available; overall compliance improved from 28% to 44%.

In terms of a qualitative assessment, understanding of the Duty of Care was better than any other environmental regulation audited; this primarily related to knowledge of the requirement to produce and retain WTNs. It was also evident that SMEs working in the waste industry had a more developed knowledge of the regulations as well as higher compliance. This was understandable as this is a core requirement of their business as well as them being more heavily scrutinised by the Environment Agency.

SMEs repeatedly failed to use the correct EWC code(s). Most had not heard of the requirement (introduced in 2002) and those that had were relying on their waste contractor to put the correct code(s) on the WTN. Moreover, closer investigation of the codes attributable to the loads delivered revealed that either the wrong code was used and/or not all relevant codes were provided; much of which can be attributed to poor understanding of how the codes are generated (i.e. it is as much about where the waste was generated as what the waste is).

Compliance with The Hazardous Waste Regulations (HWR) 2005

Out of the 36 SMEs assessed, 78% were required to comply with these regulations. Table 4.4 shows how the different stipulations of the Hazardous Waste regulations were broken down (note that due to the recent introduction of the regulations at the time of the research, only the main requirements have been included in the audit) for the purpose of the audit as well as compliance by sector and overall compliance.

Results show that compliance with the regulations was poor with an overall compliance score of 31%. The results were reasonably consistent across the different sectors with the service sector having the lowest score.

When assessing compliance with the 'no mixing rule', non-compliances were reported where mixing was evident during the audit, with results only able to provide a snap-shot. Of those sites producing hazardous waste (28 of 36), 50% were found to be compliant with this requirement. Mixing was deemed to mean that two wastes were inherently mixed in that they could be described as being in a homogeneous state (i.e. solvents mixed with wood would be classified as mixed, whereas an electrical appliance on top of a skip full of cardboard would not be described as inherently mixed).

Seventy-five percent of SMEs were complied to notify their premises; despite this, only 37% were registered as producers of hazardous waste. In contrast, the production of consignment notes was generally well complied with, especially when compared with the same requirement for WTNs under DoC. Of the 16 consignments audited, 12 produced consignment notes; of the 3 sites failing in this obligation, 2 were guilty of using WTNs to record the transaction with only one site not receiving any paperwork for the removal of hazardous waste. It should be noted that the above compliance score did not take into account how well the notes were completed.

Of the 16 consignments audited, only 5 complied with the obligation to include consignment codes on the paperwork. In general, there was a lot of confusion regarding how this 11 digit alphanumeric code was formulated.

A significant requirement in the regulations relates to the consignment note procedure and this was poorly complied with (6%). Apart from the 4 waste sites (carriers), the SMEs audited were waste producers in the chain; therefore, further research is needed to determine compliance in other areas of the chain.

A significant area of non-compliance included a failure to correctly complete consignment documentation (sections A and B for the producers), which included the description of waste, as well as details of where the waste was produced and where it was going. This was complicated by the fact that the carrier rather than the producer completed the paperwork often contributing to the note being incorrectly completed. None of the "*schedule of carriers*", "*multiple collection*"

or “*rejected consignment*” paperwork had to be completed and were thus excluded from the audit.

In terms of “*records of tipped hazardous waste*”, only data from the 4 waste SMEs was relevant. Although they kept booking-in records of loads accepted as well as generally keeping the records for three years (section 62s under EPA were audited here), none of the waste sites kept a site plan showing where waste was stored in relation to the site contours and thus all had to be recorded as being non-compliant.

Producer, holders and consignors are also compelled to keep records, in particular, they are obliged to keep details of the quantity, nature, origin and where relevant the destination, frequency of collection, mode of transport and treatment method of the waste in a specific register. Of the sites audited, producers only kept records of consignment notes rather than recording all the requirements of the regulation as detailed above; as a consequence this regulation was not complied with across any of the SMEs (0 out of 28). Waste carriers were also obliged to keep similar records in a register (for 12 months) but none of the carriers audited kept these records (0 out of 4).

In terms of consignee hazardous waste returns, this could not be assessed as the sites involved in the research were not required to have submitted a return by the time of the end of the study. However, as a general perception of compliance, consignees were extremely unclear as to the requirements; with many unaware that such a stipulation existed.

Results suggested that there was a great deal of misunderstanding concerning the 200kg producer registration exemption for sites who were mobile operations or those included on the exemption list; with many SMEs feeling that the 200kg exemption applied to all sites rather than just those on the exempt list. In addition, the broadening on the definition of hazardous waste caused confusion as SMEs could not understand what items were now classified as ‘hazardous’ especially since they were regarded as ‘non-hazardous’ under the old ‘Special’ waste regime.

Finally, those sites producing hazardous waste tended to rely on the waste carriers to arrange, organise and complete all paperwork with most unaware that the new regulations had been introduced. This was identified as a major reason for sites failing to comply with the paperwork requirement of the regulations.

Conclusions

The results from this study indicate that there were low levels of compliance with the environmental regulations audited. The audits suggested that SMEs have a low appreciation for environmental regulation and tend to base their compliance-related operational decisions on what others were doing, what they felt they could get away with as well as applying what they thought was common sense. These findings complement those of Smith *et al.*, (2000) and Gunningham (2002), who corroborate the sector’s low level of environmental and legislative awareness. Gunningham (2002) in particular, stresses that SMEs have different environmental performance characteristics to larger companies with higher levels of environmental impact per unit. This research has shown that many SMEs view their environmental impact in proportion to their size rather than their level of management and although their individual environmental impact may be low, collectively they represent a large proportion of pollution instances in the UK (Hillary, 2000).

SMEs were typically aware that the Environment Agency or their respective Local Authority could inspect at any time, although most thought that this was unlikely; in fact SMEs did not fear litigation for environmental non-compliances. Many SMEs were not aware of what actually constituted an environmental non-compliance, and therefore, as described by Petts (2000) were "*vulnerably compliant*". The research's (subjective) observations support Petts' (2000) view that smaller firms' workers feel that things get tidied up prior to an inspection visit. Management and workers also felt that self-regulation (such as The DoC Regulations) was an opportunity for the "*slacker*" companies to do nothing.

The results demonstrate that the level of environmental risk is not necessarily consistent with the level of risk attributed by the Environment Agency. It is quite possible that a large portion of those SMEs who are not covered under the Environment Agency environmental permitting/ licensing system actually pose a significant risk to the environment. It was felt that this is due to the high 'risks' on site as a result of poor operational management rather than the 'hazards' associated with the SMEs' activities.

Compliance with legislation seemed to vary by sector. It was evident that those industries whom you would expect to be more familiar with certain regulations (i.e. waste companies with waste legislation) displayed a more competent knowledge of the regulations as well as higher compliance rates (although it should be acknowledged that this was not always the case).

When comparing compliance levels with the number of prosecutions made, it was evident that enforcement action as a result of non-compliances was low in comparison. This suggests that the regulatory authorities may not be either implementing their enforcement policies as effectively as possible or they are not able to identify these non-compliances as SMEs are not part of the normal inspection regime. However, it also suggests that compliance with the regulations may not be seen as important in terms of ensuring environmental protection and thus there was no need for the Environment Agency/ Local Authority to prosecute.

It is clear that the regulatory authorities target larger companies, especially those falling within the bracket of an environmental permit or waste management licence. Although these types of businesses may often pose a much higher threat to the environment, their size means that they often have the controls in place as a result of the licence/ permit conditions making them much more responsible and self-auditing. Many unlicensed sites do not realise that they too can impact the environment and as such their impact can persist insidiously.

Compliance audits need to be regulation specific with the auditor guided by explicit legislative templates. In order for these to be effective, audit methodologies need to include site inspections, document reviews and interviews with all levels of management including site staff. In addition auditing best practice needs to be developed for each piece of environmental regulation; clearly setting out how compliance might manifest itself. Although 'command and control' legislation has its place, we need further tools in the battle against non-compliance. It is felt that environmental auditing could be used more effectively as an environmental compliance tool. Regulation-specific auditing offers a supplementary effective enforcement mechanism. However, this needs to be supported by regulation-specific methodologies for all environmental regulation.

Lastly, SMEs need guidance, advice and support in order to measure their rate of compliance; this may best manifest itself in the development of some kind of environmental compliance performance indicators (CPI) which they can then use to assess their own compliance.

Recommendations

This study indicates that there is a need for further study in the field of environmental compliance auditing in SMEs. Specific recommendations include: -

- SME compliance control systems could be improved by developing a more sophisticated SME screening process to help identify those businesses which pose a higher risk to the environment despite their perceived low environmental impact.
- The development of environmental compliance performance indicators (CPIs) would significantly improve SMEs' ability to identify and monitor their own legal performance.
- Compliance audits need to be expanded to determine if the approach can be applied to other environmental legislation as well as to other industry sectors.
- More research is needed in order to ascertain the link between environmental compliance and environmental protection.

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Tables

Table 4.2 Compliance with The Control of Pollution (Oil Storage) (England) Regulations

Compliance by SME sector Legislative Requirement	A	B	C	D	E	TOTAL
No. of sites audited [actual no.]	(10)	(10)	(10)	(4)	(2)	(36)
No. of sites storing oil, as bound by the regulations (actual no.)	(5)	(6)	(3)	(3)	(1)	(18)
Requirements for storage of oil – general						
Container of sufficient strength	(4) 80	(5) 83.3	(3) 100	(2) 66.7	(1) 100	(15) 83.3
Secondary containment ¹	(3) 60	(3) 50	(2) 66.7	(1) 33.3	(0) 0	(9) 50
Steps taken to minimise any risk of damage by impact as far as is reasonable practicable	(4) 80	(6) 100	(2) 66.7	(3) 100	(1) 100	(16) 88.9
Base and walls are impermeable ²	(3) 60	(3) 50	(2) 66.7	(1) 33.3	(0) 0	(9) 50
Base/ walls are not penetrated by any valve or pipe used for drainage	(5) 100	(6) 100	(3) 100	(3) 100	(1) 100	(18) 100
Pipes/ draw off pipes sealed	(5) 100	(6) 100	(3) 100	(3) 100	(1) 100	(18) 100
Valve, filter, sight gauge, vent pipe or other ancillary equipment situated within the bund	(5) 100	(6) 100	(3) 100	(3) 100	(1) 100	(18) 100
Drip tray provided for unbunded equipment (fill pipes)- no. of sites requiring drip trays in square brackets [], actual no. with drip trays in round brackets ()	[2] (1) 50	[3] (1) 33.3	[0] (0) n/a	[1] (0) 0	[0] (0) n/a	[6] (2) 33.3
Fixed tanks (%)						
No. of sites with fixed tanks (actual no.)	(5)	(6)	(3)	(3)	(1)	(18)
Sight gauge fitted with a valve	(4) 80	(4) 66.7	(2) 66.7	(2) 66.7	(1) 100	(13) 72.2
TOTAL COMPLIANCE BY SECTOR - %	[42] (34) 80.1	[51] (40) 78.4	[24] (20) 83.3	[25] (18) 72	[8] (5) 62.5	
TOTAL COMPLIANCE WITH REGULATION - %	78					

Actual numbers are given in brackets (), potential numbers in [] and % are un-bracketed

¹As required by the regulations, depending on size and number of containers or drums

²Where no bunding was present, sites were recorded as non-compliant

KEY:**Sector A:** Printing Industry**Sector B:** Manufacturing Industry**Sector C:** Service Industry**Sector D:** Waste Industry**Sector E:** Food Processing Industry

Table 4.3 Compliance with section 34 Environmental Protection Act and The Environmental Protection (Duty of Care) Regulations

Compliance by SME sector Legislative Requirement	A	B	C	D	E	TOTAL
No. of sites audited (actual no.)	(10)	(10)	(10)	(4)	(2)	(36)
No. of sites bound by the regulations (actual no.)	(10)	(10)	(10)	(4)	(2)	(36)
No. of deposits audited (actual no.)	(20)	(20)	(20)	(8)	(4)	(72)
Environmental Protection Act Section 34 (%)						
To prevent the escape of the waste from his control or that of any other person	40	50	90	25	50	55.6

Compliance by SME sector Legislative Requirement	A	B	C	D	E	TOTAL
On the transfer of the waste, to secure - (i) that the transfer is only to an authorised person or to a person for authorised transport purposes	20	20	10	100	0	25
On the transfer of the waste, to secure - (ii) that there is transferred such a written description of the waste as will enable other persons to avoid a contravention of that section and to comply with the duty under this subsection as respects the escape of waste - no. of available WTNs given in circular brackets - no. of fully compliant WTNs given in square brackets - % of fully compliant WTNs from total transfers audited – no brackets	(8) [0] 0	(12) [0] 0	(9) [1] 5	(8) [2] 25	(2) [0] 0	(39) [3] 4.2
TOTAL COMPLIANCE BY SECTOR (%)	15	17.5	27.5	43.8	25	
TOTAL COMPLIANCE WITH ACT (%)	22.2					
Duty of Care Regulations						
No. of deposits audited (actual no.)	(20)	(20)	(20)	(8)	(4)	(72)
No. of available transfer notes (actual no.)	(8) 40	(12) 60	(9) 45	(8) 100	(2) 50	(39) 54.2
Transfer Notes %						
The transferor and transferee shall, at the same time as the written description is transferred, complete a transfer note and sign on their behalf	(6) 30	(9) 45	(5) 25	(5) 62.5	(1) 25	[72] (26) 36.1
A transfer note shall %: -						
Identify the waste according to EWC	(4) 20	(7) 35	(2) 10	(1) 12.5	(0) 0	[72] (14) 19.4
State its quantity	(3) 15	(5) 25	(2) 10	(5) 62.5	(1) 25	[72] (16) 22.2
State whether containerised or loose	(1) 5	(2) 10	(1) 5	(2) 25	(0) 0	[72] (6) 8.3
State type of container, if applicable	(1) 5	(2) 10	(1) 5	(2) 25	(0) 0	[72] (6) 8.3
State the time and place of transfer	(0) 0	(0) 0	(0) 0	(0) 0	(0) 0	[72] (0) 0
Give the name and address of the transferor and transferee	(7) 35	(10) 50	(8) 40	(7) 87.5	(4) 100	[72] (36) 50
State whether the transferor is the producer or importer of the waste	(8) 40	(12) 60	(9) 45	(8) 100	(2) 50	[72] (39) 54.2
State which category (if any) the transferor and transferee falls and provide any additional information	(3) 15	(5) 24	(4) 20	(3) 37.5	(0) 0	[72] (16) 22.2
Duty to keep written descriptions of waste and transfer notes %						
WTN kept for a period of 2 years from the transfer (from a total of 36 sites)	(1) 5	(1) 5	(2) 10	(6) 75	(0) 0	[36] (10) 27.8
TOTAL COMPLIANCE BY SECTOR (%)	20	31	20.5	56	23.8	
TOTAL COMPLIANCE WITH REGULATION (%)	27.5					

Actual numbers are given in round brackets (), potential numbers in square brackets [] and percentages (%) are un-bracketed.

KEY:**Sector A:** Printing Industry**Sector B:** Manufacturing Industry**Sector C:** Service Industry**Sector D:** Waste Industry**Sector E:** Food Processing Industry**Table 4.4 Compliance with The Hazardous Waste (England and Wales) Regulations**

Compliance by SME sector Legislative Requirement	A	B	C	D	E	TOTAL
No. of sites audited (actual no.)	(10)	(10)	(10)	(4)	(2)	(36)
No. of sites bound by the regulations (actual no.)	(10)	(8)	(5)	(4)	(1)	(28)
No. of consignments audited (actual no.)	(5)	(4)	(2)	(4)	(1)	(16)
Compliance with the Hazardous Waste Regulations 2005						
Mixing Hazardous Waste (%)						
No mixing of hazardous waste	(5) [10] 50	(5) [8] 62.5	(2) [5] 40	(1) [4] 25	(1) [1] 100	(14) [28] 50
Notification of Premises (%)						
Premises registration	(4) [10] 40	(4) [8] 50	(1) [5] 20	(1) [4] 25	(0) [1] 0	(10) [28] 35.7
Consignment Notes (%)						
Unique code assigned to hazardous waste	(1) [5] 20	(1) [4] 25	(0) [2] 0	(3) [4] 75	(0) [1] 0	(5) [16] 31.3
Production of consignment notes	(4) [5] 80	(3) [4] 75	(1) [2] 50	(3) [4] 75	(1) [1] 100	(12) [16] 75
Consignment note procedure	(1) [5] 20	(0) [4] 0	(0) [2] 0	(1) [4] 25	(0) [1] 0	(2) [16] 12.5
Site records						
Records of tipped hazardous waste	n/a	n/a	n/a	(0) [4] 0	n/a	(0) [4] 0
Producers', holders' and consignors' records	(0) [10] 0	(0) [8] 0	(0) [5] 0	(0) [4] 0	(0) [1] 0	(0) [28] 0
Carrier's records	n/a	n/a	n/a	(0) [4] 0	n/a	(0) [4] 0
TOTAL COMPLIANCE BY SECTOR (%)	33.3	36.1	19	28.1	33.3	
TOTAL COMPLIANCE WITH ACT (%)	30.7					

Actual numbers are given in round brackets (), potential numbers in square brackets [] and percentages are un-bracketed.

KEY:**Sector A:** Printing Industry**Sector B:** Manufacturing Industry**Sector C:** Service Industry**Sector D:** Waste Industry**Sector E:** Food Processing Industry

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4.2.2 Wilson, C, D, H; Kemp, S and Williams, I, D (2008)

A methodology for assessing environmental compliance in small to medium-sized enterprises. In Townshend, M. (Ed): Proceedings of Waste 2008- Waste and Resource Management – A shared responsibility. Stratford-upon-Avon, 16-17 September, 127-136.

This paper reviews the general auditing literature and uses experiences and research data generated from previous environmental compliance audits to demonstrate how a specific environmental compliance assessment approach can be developed for SMEs. The audit approach presented contributed to the final methodology used during data collection (see Chapter 3).

The paper suggests that a 'regulation-specific' auditing approach is an effective way of determining legal performance in SMEs, although this needs to be supported by specific methodologies and strategies for each regulation audited.

This paper is also supported schematically by a poster presented at the 'WASTE2008' Conference (See Appendix 11).

See below for an edited copy of the paper.

A Methodology for Assessing Environmental Compliance in Small and Medium-Sized Enterprises

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Abstract

Small and medium-sized enterprises face an environmental ‘compliance conundrum’ as they seek to meet the ever-increasing legislative demands placed on them by Government whilst still trying to operate effectively. Environmental auditing is recognised as a tool for improving compliance as it offers a supplementary effective enforcement mechanism. However, there has been little published research specifically on environmental compliance auditing techniques. This paper reviews the general auditing literature and uses experiences and research data generated from previous environmental compliance audits to demonstrate how a specific environmental compliance assessment approach can be developed for SMEs. The paper suggests that a ‘regulation-specific’ auditing approach is an effective way of determining legal performance in SMEs, although this needs to be supported by specific methodologies and strategies for each regulation audited.

Introduction

See section 1.1 for an introduction to the subject.

Environmental compliance auditing

See section 2.6.3 for compliance auditing literature.

Purpose of the study

This study builds on the findings of previous research conducted by Wilson *et al.*, (2007). Their investigation involved 36 environmental compliance audits covering a range of legislation in a variety of SME sectors (see “Previous Compliance Audit Results” for an overview). This paper uses the experiences and data generated from these audits to illustrate how specific environmental compliance assessment methods can be developed to help SMEs prove legal compliance. This approach has been targeted at SMEs, but could be adopted in any size of organisation and/ or by environmental regulators.

The research has been part-funded by the EPSRC’s Sustainable Urban Environment Waste Consortium programme.

Methodology

A previously published methodology (Wilson *et al.*, 2007) was adopted and amended in order to develop a more sophisticated and holistic approach to compliance auditing in SMEs. The approach included the development of more refined regulation-specific (RSTs) and environmental offences (OTs) audit templates. The RSTs were developed for each piece of legislation audited (incorporating amendments, revocations, repeals and commencement orders) and included a regulation-by-regulation break-down of the legislation as well as notes as to what the auditor should look for as well as what questions to ask so that both the spirit and letter of the law was covered. The OTs were developed as a reference point so that regulation breaches could be classified into corresponding offences (if applicable). These features were

incorporated into the 3 recognised stages of environmental auditing (Moorman and Kirsch, 1991 and Carter, 2003) in order to further facilitate an environmental compliance audit approach.

The offences audit templates were designed in addition to the regulation-specific audit templates so that where legislation was outcome focused (as often detailed in Acts of Parliament), offences could be determined in addition to where regulations were not met.

Previous Compliance Audit Results

Wilson *et al.*s., (2007) audits were conducted in 36 SMEs and focused on 3 sets of regulations:

- The Control of Pollution (Oil Storage) (England) Regulations 2001;
- Environmental Protection Act 1990 (section 34) (as amended) and The Environmental Protection (Duty of Care) Regulations 1991 (as amended); and
- The Hazardous Waste (England and Wales) Regulations 2005.

Overall, the results suggested low levels of compliance with the environmental regulations audited and indicated that SMEs had a low appreciation of environmental regulation; tended to base their compliance-related operational decisions on what others were doing and what they felt they could get away with; and tried to apply low-technology common-sense approaches. Other studies by Smith *et al.*, (2000), Bland *et al.*, (2004) and Gunningham (2002) corroborate SMEs' low level of environmental and legislative awareness. Gunningham (2002), in particular, stresses that SMEs have different environmental performance characteristics to larger companies with higher levels of environmental impact per unit. Many SMEs view their environmental impact in proportion to their size rather than their level of management and although their individual environmental impact may be low, collectively they represent a large proportion of pollution instances in the UK.

The compliance audits also showed that SMEs are often not aware of what constitutes an environmental non-compliance, and therefore, as described by Petts (2000) are "*vulnerably compliant*". SMEs experience difficulties complying with environmental legislation and thus they need guidance, advice and support in order to identify the legal requirements as well as measure their rate of compliance; this may best manifest itself in the development of regulation-specific environmental compliance performance indicators (CPIs).

To improve this, Hopkins' (1994) suggests that we need to think carefully about what we should be asking SMEs to comply with. He explained that specific procedural requirements can be easier to comply with than outcome focused legislation. Interviews with management and site staff identified that SMEs have problems applying the "*reasonably practicable*" mantra associated with this type of legislation; this can make the legislation un-auditable from an SME's perspective never mind that of the regulator.

Compliance Assessment Methodology

The following section outlines recommended approaches when assessing environmental compliance in SMEs. For these assessments, **compliance** is defined as suggested by IMPEL, the EU Network for the Implementation and Enforcement of Environmental Law, as: "*full implementation of environmental requirements. Compliance occurs when requirements are met*

and desired changes are achieved" (IMPEL 1992). **Compliance assessment** is defined as the "overall approach taken to check compliance with all the conditions of a permit or other regulatory instrument" (IEMA Practitioner, 2005).

A key objective of compliance auditing is to determine both the 'letter' and 'spirit' of compliance. These two facets should be studied simultaneously:

- The letter of the law should be assessed objectively, based on empirical evidence, whereby each prescriptive part of each regulation should be directly assessed; and
- The spirit of the law can only be assessed subjectively, firstly by deciphering the intent of the legislation and then making a judgment as to whether the SME has made a reasonable attempt to comply with the aim of, as well as the specific conditions in the regulations.

Compliance audits

In terms of a methodological approach to the general audit, we advocate the use of the established "*pre-audit, audit and post-audit*" methodology suggested by Moorman and Kirsch (1991), ISO 19011 (Carter, 2003) and ISO 14015. Even though the following description is less detailed than that in ISO 19011 and ISO 14015, more emphasis is put on what should be looked for in the audits rather than the order in which it should be conducted as long as each of the audit trails established are closed out.

Clearly each stage of the process is important, although the crucial stage is the main 'audit'. It is recommended that as well as documentation reviews of relevant paperwork and physical inspections of an organisation's premises/ activities, the audit should include interviews with site management and staff so that an assessment can be made of their knowledge and understanding of the applicable regulations; these can then be measured against the compliance rates generated in the audits (as advocated by the ISO 19011 standard). This comparison will help to reveal how deliberate compliance has been, as well as enabling an assessment of likely future compliance.

Pre-audit

Based on the findings from the previous research conducted by Wilson *et al.*, 2007, the authors' recommend that the pre-audit stage includes a review of all related regulations as well as gaining some knowledge of the site's compliance history, current and past uses. An efficient way of doing this is via a fact-finding telephone call; lasting 10-30 minutes, depending on the complexities of the site. The telephone conversation should be used to find out as much as possible about the site as well as explaining the audit process. It is important to speak to the person who has the best knowledge of the site and who is in a position of influence; this should be the person responsible for environmental management (if relevant), the MD or production/ operation/ contract manager. Discussions should cover a wide range of issues including:

- Confirming that the company falls within the EU SME definition;
- Establishing the organisation's activities and size (some organisations may be able to provide a floor plan);
- Identifying the range of staff roles and availability during the proposed audit date;
- Identification of site history, knowledge of land contamination or any other known compliance issues;

- Waste storage and collection arrangements (so the audit can be planned to coincide);
- Checking that site records will be available on the day of the audit;
- Seeking permission to speak to other members of staff, seeking permission to tape-record discussions (if relevant) and take photographs;
- Establishing the hours of operation (shift patterns, night working), so to ensure representativeness;
- Providing assurances about auditor independence, confidentiality and disclosure of results;
- Explaining how results will be reported back; and
- Assuring the auditors' own safety by clarifying site health and safety and emergency procedures, car parking facilities and directions to the site.

Prior to visiting the SME, the above information should be confirmed in writing along with providing the auditor(s) contact details to facilitate any SME follow-up questions (if necessary).

Before starting the audit, it is essential to consider its 'scope'; is it to cover a single piece of legislation (e.g. The Environmental Protection [Duty of Care] Regulations, 1991), a group of legislation (e.g. waste, water, land or air) or ALL relevant environmental legislation. Whichever is the case, the compliance audit must be conducted by an appropriately experienced and qualified 'expert' who is familiar with the type of operation and application of the legislation (as aided by the audit templates).

It is important to acknowledge that compliance audits require assessment of the documented or undocumented company procedures as well as the knowledge and understanding needed to fully meet the legislative requirements (the latter of which is considered 'spirit' of the law). As well as considering the current status of compliance (i.e. at the time of the audit), the spirit of the law judgement should assess an SME's ability to comply in future and/or whether current compliance was intentional.

When selecting the regulations to be audited, consideration should be given to the chronological spread of the legislation in order to ensure a rounded opinion of compliance can be ascertained. It should be recognized that when making compliance judgements, guidance on interpretation of recently introduced legislation is not often published until several months after implementation, thus making 'compliance' open to interpretation.

To aid the compliance process, each regulation (statutory instrument) should be broken into its respective requirements (bearing in mind that where minimum threshold limits are in place, some regulations will not apply to SMEs). A key output from this study was the development of regulation-specific audit templates (RSTs) detailing all of the requirements of each of the relevant legislation. The RSTs were then closely linked with offences' audit templates (OTs), which were used to specify the offence committed (or not) as a result of not meeting the requirements in the regulations (covering statutory and statute law). The compilation of the RSTs and OTs can be a daunting and tedious task due to the non-codified arrangement of the majority of UK legislation - as a result, particular care needs to be taken to ensure amending legislation, partial and full revocations, repeals and the use of commencement orders, are considered.

In terms of the types of SMEs that should be audited, it is important to try and make any sample representative of the total population. This is extremely difficult due to the sheer number and range of SMEs, however it is felt that by conducting audits in a broad range of SME sizes and

sectors, a realistic reflection of compliance rates could be generated and be broadly applied to other SMEs.

The audit

This section outlines lessons learned from previous audits, findings from Wilson *et al.*, 2007, and published guidance and literature. Although it is important to plan the audit carefully, no amount of methodology development can predict every eventuality (Carter, 2003), therefore, the auditor must be prepared to adapt to specific site situations while still ensuring that they observe everything they have to observe and ask all the necessary questions.

The authors suggest that the first part of the audit is to observe the organisation's operations in sequence (where possible) so that the environmental compliance ramifications of each process can be understood. This should be used to establish a number of further audit trails which can be investigated later and/ or integrated into the other methodology approaches. The audit should be spread over a sufficiently long period of time so that activities can be seen on more than one occasion- at a minimum it is suggested that audits should cover at least a whole day's worth of activities with follow-up visits planned if incidents restrict this. Audit dates/ times should be designed to coincide with key activities on site (i.e. waste removal) so that as many of the regulation-affected activities can be observed rather than outcomes inferred retrospectively. The RSTs should be used as checklists when observing site activities as well as asking follow-up questions. As well as detailed notes, photographs should be taken (subject to permission) and in addition to interviews with site management, discussions should take place with site staff and sub-contractors (e.g. it would be appropriate to question waste carriers when they arrive on site) as they often have contrasting views to management on how things are done. Generally, straight-forward procedural questions should be targeted at site staff with more detailed legislative questions targeted at management- with the key issue to ensure that the necessary information is retrieved from the most appropriate people.

To exemplify this approach, key issues that should be considered prior to auditing legislation that frequently applies to SMEs are outlined below.

The Control of Pollution (Oil Storage) (England) Regulations 2001:

- Particular attention needs to be given to secondary containment arrangements as different bunding requirements exist for containers and drums as well as when there is more than one container or drum. Checks should be made as to the volumes of the secondary containment to establish that storage volumes are adequate (or not)- this may mean following up suppliers of the bunding to confirm compliance with the regulations;
- Where there are different oil stores on site (and thus different containment systems), these need to be assessed independently rather than collectively. Thus, it is important to bring additional copies of the blank audit templates to enable the results for each containment system to be recorded separately; ensuring that data will not become confused and muddled;
- Checks should be made on secondary containment for ancillary equipment (e.g. fill pipes) as this is often neglected and they are often not contained within an additional drip tray;
- It is important to remember that the regulations relate to the storage capacity of the container/ drum and not just the volume of oil within the container/ drum;

- Where a building is used as ‘secondary containment’, its suitability in terms of impermeability features, containment capacity and drainage arrangements should be tested; and
- Remember that there are different requirements for fixed tanks and mobile tanks.

Section 34 EPA (1990) and The Environmental Protection (Duty of Care) Regulations 1991:

- Waste transactions need to be physically observed, therefore, it is important to coordinate the audit with the collection day(s). This allows waste description details to be checked as well as determining if they were completed at transfer (i.e. ensuring that retrospective completion of waste transfer notes [WTNs] is avoided) and who initiated their completion;
- In terms of season tickets, the “*time of the transfer*” requirement should be taken as when the first transaction occurs (if transferring a number of loads over a 12 month period). Checks should also be made to ensure that waste types are consistent across the season ticket period;
- In order to assess an SME’s ability “*to prevent a contravention by any other person*” consideration should be given to whether wastes are inappropriately mixed, whether waste storage in skips is secure (for instance) or whether loose waste is stored around the waste storage area;
- Checks should be made to ensure that the last 2 years of transfer notes have been retained;
- Consideration should be given as to whether all the listed requirements in the regulations are contained on the WTNs, including the use of the appropriate List of Waste (LOW) code;
- The number of WTNs audited should be representative of the number of waste movements- i.e. a minimum sample of 20% is suggested (especially if a number of waste carriers are involved). Each WTN’s compliance should be recorded on separate RSTs;
- Checks should be made to determine if SMEs know the final destination of their waste and whether they have ever made enquiries about this;
- Checks should be made to determine if the producer and carrier provided the “*additional information requirements*” on the WTN; and
- In order to get full insight into compliance with the regulations, audits need to be completed with all those involved in the waste chain (producer, broker, carrier and consignee).

The Hazardous Waste (England and Wales) Regulations (HWRs) 2005:

- Hazardous waste transactions need to be physically observed, therefore, it is important to coordinate the audit with the collection day(s). This allows waste description details to be checked as well as determining if they were completed at transfer (i.e. ensuring the retrospective completion of consignment notes [CNs] is avoided) and who initiated their completion (the onus should be on the producer);
- The number of waste consignments audited should be representative of the number of waste movements- i.e. a minimum sample of 20% (especially if a several carriers are involved). Again, each consignment’s compliance should be recorded on separate RSTs;
- Unlike under duty of care, the HWRs specify the use of specific consignment note paperwork and thus the organisation’s own documentation should not be used (branding is acceptable);

- Attention must be given to the additional paperwork requirements for producers', holders' and consignors' records, which must be kept in a register;
- It is recommended that checks are made with the Environment Agency public register when confirming presence of the 'premises codes'- codes expire annually, official certificates are not issued and some carriers have been known to use their own codes instead of producers;
- Individual premises must have their own (unique) 6-digit alpha-numeric premises code;
- Each consignment note (CN) must use its own (unique) consignment code - uniqueness can be determined by checking a number of consecutive consignment notes;
- Checks should be made to ensure that the last 3 years of CNs have been retained;
- Audits need to consider consignees as well as producers and carriers so that data can be generated for all the requirements of the regulations; and
- Some of the regulations contain several requirements within the same regulation number, therefore, it is beneficial to break the regulations down further into individual requirements so that more knowledge can be gained about compliance within each specific feature of the regulations rather than just the overall regulation.

Post-audit activities

After the facility tour, those involved should be de-briefed, given any immediate findings and asked any additional questions (closing out all audit trails). After leaving the site, any uncertainties should be checked against the relevant statute/ statutory legislation.

Using the RSTs and OTs, observations, photographs and interview transcripts (if appropriate), a concise compliance status report should be produced that outlines the key areas to be addressed. In particular, any offences should be identified followed by key technical or administrative breaches.

Conclusions and Recommendations

The paper suggests that when auditing compliance, a 'regulation-specific' approach is an effective way of determining legal performance in SMEs. The audits need to consider the 'letter' and 'spirit' of the law and be supported by regulation-specific methodologies as part of the site observations, environmental paperwork checks, and site staff and management discussions.

Although this auditing approach has focused on SMEs since they often lack the resources of larger organisations, it is felt that this approach - with a little 'tweaking' - could be utilised by any size of organization, as well as any environmental regulator.

The following specific conclusions have been drawn from this study: -

- Regulation-specific templates (RSTs) and offences audit templates (OTs) provide useful *aide-memoirs* and help to establish the necessary audit trails to assess compliance; and
- The non-codified and un-prescriptive nature of UK legislation makes much of it un-auditable for SMEs. From an SME perspective, it is important that the Government is clear on the meaning of compliance otherwise the legislation become meaningless! A key improvement would be to encourage more involvement by SMEs in the consultation process prior to new legislation being introduced.

The following recommendations for further study have been made: -

- The RSTs need to be developed for 'lay' use and expanded to cover other environmental legislation so that individual templates exist for each SME role in the supply chain;
- Auditing best practice and compliance performance indicators (CPIs) need to be developed for all environmental legislation, clearly setting out how compliance manifests itself; and
- There is a need for further evaluation and improvement in the environmental compliance control systems currently regulating SMEs.

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4.2.3 Wilson, C, D, H and Williams, I, D (2008)

Environmental compliance in small- and medium-sized enterprises. Proceedings of the *CIWM Annual Conference*, 10-13 June 2008, Paignton, Conference Session 9, Paper 2.

This paper builds on the initial results from Wilson *et al.*, (2007) by including results from compliance audits and interviews conducted in waste facilities. This allowed comparisons to be made between those SMEs controlled by direct EA regulation and those that are not.

The approach presented and experiences gained contributed to the final methodology used during data collection (see Chapter 3).

See below for an edited copy of the paper.

Environmental Compliance in Small and Medium-Sized Enterprises

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Abstract

Better regulation has been the focus of a considerable amount of recent government initiatives. Hampton (2005) and the Better Regulation Commission have highlighted the need for strategic thinking when it comes to formulating and propagating regulation. Hampton suggested that part of the solution is to regulate business using a risk-based model. Although the Environment Agency (EA) in England and Wales already uses a 'risk-based' system to regulate those businesses falling under the environmental permitting regime (formally Waste Management Licensing and/or Pollution Prevention and Control), this only represents a small portion of UK businesses for which the EA regularly inspect. Local Authorities have duties for regulating 'less risky' sites but instead of actively enforcing the regulations they only have the resources to respond to complaints. As a result, the legal performance of many small and medium-sized enterprises (SMEs) remains largely un-quantified.

SMEs are expected to comply with a vast range of environmental laws, regulations and standards with little to differentiate their workload from that of larger, more resource-rich companies. The EA suggests that 80% of environmental incidents are caused by SMEs, however, anecdotal evidence suggests that regulatory authorities concentrate their efforts on larger organisations that they perceive to have a high potential to pollute.

Currently the EA regulates those businesses that fall under the new Environmental Permitting Regulations (EPRs) (2007) using the Environmental Protection Operator and Pollution Risk Appraisal (EP OPRA) system. However, their compliance assessments don't specifically take into account any legislation except environmental permitting (moreover, inspections only consider a sample of the aforementioned conditions). Therefore, there are significant environmental regulations which aren't audited under the EA's current system and organisations that are not party to any permitting regime are unlikely to be audited for compliance against ANY environmental regulation by the EA or their local authority.

The general consensus is that many organisations are over-regulated and in many cases inspected unnecessarily. There has also been a great deal of influence from the EU but very little has been published on actual legal compliance rates. Much of this is because it is difficult to determine compliance, with the EA's prosecution and enforcement action not truly reflecting compliance rates.

This paper uses research to give a contemporary overview of UK SMEs' compliance with environmental legislation, focusing on: -

- the level of compliance;
- the impact and effectiveness of environmental legislation;
- environmental compliance control systems; and
- recommendations for further research.

Keywords: Auditing, compliance, environmental law, SMEs.

Introduction

See section 1.1 for an introduction to the subject.

Purpose of the study

The study builds on the initial findings from previous research conducted by Wilson *et al.*, (2007). The initial study comprised of 36 environmental compliance audits covering a range of legislation in a variety of SME sectors; overviews of the results from 3 regulation audits have been included in section 3. The follow-up study conducted further audits and interviews and aimed to consider the impact and effectiveness of environmental legislation; how we might improve the environmental compliance control systems for SMEs as well as making recommendations for further research for the management of SME compliance.

Methodology

The research utilised and built upon a previously developed methodology (Wilson *et al.*, 2007) in order to develop a more sophisticated and holistic approach to compliance auditing. The approach included the development and trialling of more refined regulation-specific and environmental offences audit templates as well as detailed interview questions for SME management and site staff. These additional features were incorporated into the 3 recognised stages of environmental auditing (i.e. pre-audit fact-find, audit [site visit and document reviews] and post-audit activities) as recommended by Moorman and Kirsch (1991) in order to gain a full picture of individual SME compliance.

The offences audit templates were designed in addition to the regulation-specific audit templates so that where legislation was outcome focused (as often detailed in Acts of Parliament), offences could be determined in addition to where regulations were not met.

Interviews were conducted and recorded with a member of management as well as individual members of site staff. Interviews with management and site staff lasted approximately 1hr and 20 minutes respectively.

Five SMEs from the waste sector from the north-west of England were studied. Detailed environmental permit (waste management licences at the time of the study) audits were conducted with other environmental legislation being considered holistically.

Results

Compliance with environmental legislation

Out of the 36 SMEs assessed, half were required to comply with The Control of Pollution (Oil Storage) (England) Regulations (OSRs) 2001. Results show that compliance with the regulations was reasonably high except for the requirements relating to 'secondary containment (bunding) for containers' (50% compliance) and 'containment (drip trays) for ancillary equipment' such as fill pipes (33%) - all offences under regulation 3- "*general requirements for storage of oil*". Compliance scores for 'bund wall permeability' were inevitably low (50%) as

containers with no bunding were automatically failed. Encouragingly, 100% of those containers with bunding were adequate in terms of permeability.

Overall, there was 78% compliance with individual requirements. However, these results should be interpreted with caution as high scores (i.e. bund permeability) may distort lower scores (i.e. secondary containment) and give an overall false impression that compliance was relatively high when actual compliance varied greatly across the regulations.

Other key findings: -

- Few SMEs were aware of the specific requirements which ensured compliance.
- Some managers thought that the regulations related to the amount of oil stored (and thus they may be exempt) rather than the size of the container and the potential amount of stored oil.
- Few managers were aware of the regulation relating to 'secondary containment' - the regulations specify 4 scenarios for containment depending on whether oil is stored in containers or drums and whether these are singular or multiple. Many thought that double-skinned tanks provided adequate secondary containment; however, these tanks do not prevent escape of oil if the tanks are overfilled. Inappropriate use of bunds as storage areas for equipment and tools negated their use in several instances and were recorded as non-compliant.

All 36 SMEs assessed were required to comply with Environmental Protection Act 1990 (EPA) (section 34) (as amended) and The Environmental Protection (Duty of Care) Regulations 1991 (DoC) (as amended). Overall, compliance with the EPA and the DoC Regulations was poor with compliance levels of 22% and 28% respectively (as supported by Bland *et al*, 2004). In terms of the requirement "*to prevent the escape of waste*", the audits identified several breaches. As expected, those SMEs handling the largest amounts of waste scored the lowest as there were more opportunities for mistakes (compliance varied from 25% to 90%). The non-compliances identified included escaping waste- an offence under section 33(1)(c) "*treat, keep or dispose of controlled waste in a manner likely to cause pollution of the environment or harm to human health*".

Other key findings: -

- Only 25% of SMEs complied with the requirement to ensure that waste "*is transferred to an authorised person or for authorised transport purposes*".
- Of the 72 transfers sampled, 54% had a WTN note 'available'.
- Of the 72 transfers, only 36% of WTNs were signed by both parties (transferee and transferor) at the time of transfer, revealing the fact that many WTNs went unchecked on transfer. Most included the name and address of the transferor and transferee (36 out of 39) with all WTNs stating whether the transferor was the producer or the importer. However, just under half (46%) of WTNs were not produced or 'available' during the audits- all potential offences under section 34(5) (DoC Regulations) and section 34(6) (section 34(1) requirements).
- Only 22% of SMEs complied with the requirement to specify the quantity of waste (22%), those who did tended to specify broadly (i.e. "*1 skip*") rather than stating volume or weight.
- Only 19% of SMEs identified the waste according to the correct List of Waste (LOW) code. Non-conformances included: failure to use any codes, use of the wrong codes and/or failure to identify all relevant codes.

- Only 10 of 36 sites (28%) met the requirement to keep WTNs for 2 years from the date of transfer.

In terms of compliance with The Hazardous Waste (England and Wales) Regulations (HWR) 2005, 78% were required to comply. Overall compliance with these regulations was poor, with a compliance score of 31%. When assessing compliance with the '*no mixing rule*', non-compliances were reported where mixing was evident during the audit, with results only able to provide a snap-shot. Of those sites producing hazardous waste (28 of 36), 50% were compliant under Part 4 of the HWRs.

Seventy-five percent of SMEs were required to notify their premises; despite this, only 37% were registered with the EA. In contrast, most SMEs generated appropriate consignment notes, especially when compared with the same requirement for WTNs under DoC. Of the 16 consignments audited, 12 produced notes; of the non-complaint consignments, 2 used WTNs to record the removal of hazardous waste with 2 not producing any paperwork.

Other key findings: -

- Consignment notes (sections A and B for the producers) were not well completed (an offence under regulations 33-38), often failing to give the description of waste, details of where the waste was produced and where it was being consigned - a fact complicated by the carrier rather than the producer arranging and completing the paperwork.
- Producer, holder and consignor records (a register of the quantity, nature, origin and where relevant the destination, frequency of collection, mode of transport and treatment method) were not well kept. Producers only kept records of consignment notes rather than recording all the requirements as detailed above; as a consequence this wasn't complied with by any SMEs (0 of 28). None of the carriers audited (0 of 4) kept their records in a register (for 12 months) - all offences under Part 7 of the HWRs.
- The 200kg producer registration exemption caused a great deal of confusion; with many SMEs incorrectly thinking that the 200kg exemption applied to ALL sites rather than just those exempted- an offence under regulation 21 and 22 of the HWRs.
- The broadening of the definition of hazardous waste caused confusion as SMEs were unsure as to what waste was now classified as 'hazardous' especially if they were regarded as 'non-hazardous' under the old 'special' waste regime.

SME compliance systems

Overall, the audit and interviews showed that although knowledge and understanding was better on permitted sites (particularly due to the WAMITAB competence requirements), SMEs' compliance with specific permit conditions was poor. Of the 5 permitted sites audited, 3 operated under the 'old-style' licence and 2 were 'standard condition' licences. Compliance issues with comparable conditions have been outlined below: -

- The general feeling was that little attention was paid to the specific conditions with sites 'aiming' to operate in conjunction with the outcome of their EA inspections.
- Two of the 5 sites audited did not have adequate technical competence cover. One site's 2-year grace-period had lapsed and they were still in the process of completing the relevant qualification, the other non-compliant site had 'cover' however, no evidence of their site attendance was available.

- Sites generally complied well with infrastructure requirements such as impermeable hard-standing and sealed drainage, this was generally due to the fact that some of the sites were based on previous waste sites where the infrastructure was already in place, moreover, hard engineering requirements were seen as being 'less negotiable' with the EA.
- Compliance with daily treatment and annual throughput limits were well met. This was primarily due to the fact that conditions were set well above operational levels and thus it would be impractical for them to be exceeded.
- Where it was possible and 'advantageous' to breach conditions, the 5 sites viewed this as acceptable as long as the situation was rectified once identified by the EA; this type of activity related to the acceptance and long-term storage of hazardous waste on non-hazardous sites.
- There were breaches of paperwork requirements on all 5 sites, for instance, in the 3 'old-style' licences (where site record requirements are much more explicit), site diaries were not well completed with 2 of the sites not regularly completing a diary and the 3rd site only partially recording the specified requirements. In terms of the standard condition licences, both sites were unaware of what an accident management plan consisted of although partial (albeit out-dated) working plans were in existence - The above constituted an offence under regulation 38(1)(b) of the new EPRs: "*to fail to comply with or to contravene an environmental permit condition*").

As well as offences, the audits identified several specific issues with individual legislation, for instance, section 34 EPA (as amended) and the DoC Regulations. Section 34(1)(c)(i) states that the waste must only be transferred to an authorised person (i.e. a waste carrier) or to a person for authorised transport purposes (i.e. transporting waste within the same premises), however, this section is linked with 34(1)(c)(ii) (a written description of the waste must be transferred) by an "*and*", implying that even waste transferred within the same premises potentially needs a WTN, which has never been nor never could be practical. To further support this, the DoC Regulations allow for the stating of an authorised transport purpose on the WTN. If this is the case, then it is suggesting that a WTN must be used for all transfers even if transporting within the same premises.

In addition, the transport of waste from GB to outside GB is an authorised transport purpose implying that exports should be documented on a WTN even though "*export*" is not listed in the opening preamble in section 34(1) of the Act.

General Discussion

The audits and interviews suggested that there were low levels of compliance with the environmental legislation audited. These findings complement those of Smith *et al.*, (2000) and Gunningham (2002), who corroborate SMEs' low level of legislative awareness. Gunningham (2002) in particular, stresses that SMEs have different environmental performance characteristics to larger companies with higher levels of environmental impact per unit.

The audits have shown that many SMEs view their potential environmental impact in proportion to their size rather than their management and although their individual environmental impact may be low, collectively they represent a large proportion of pollution instances in the UK

(Hillary, 2000). Moreover, many SMEs were not aware of what actually constituted an environmental offence, and therefore, in the words of Petts (2000) were “*vulnerably compliant*”.

In terms of the impact and effectiveness of environmental legislation, prosecution and enforcement action as a result of non-compliances was low. This suggests that the regulatory authorities may not be either implementing their enforcement policies as effectively as possible or they are not able to identify these non-compliances as SMEs are not part of the normal inspection regime. It also suggests that compliance with certain regulations may not be seen as important to ensure environmental protection and thus there was no need to prosecute.

The interviews suggested that several of the EA visits were prompted by complaints. However, Hutter (1986) explained that these aren't necessarily the most reliable source as they are not necessarily prompted by the most serious offences; this is compounded by the fact that relying on the public to report offences is problematic as they do not possess the requisite knowledge to identify offences.

In terms of improving the environmental compliance control systems for SMEs, the results demonstrate that the level of environmental risk is not necessarily consistent with the level of risk attributed by the EA. It is quite possible that a large portion of those SMEs who are not covered by the EA environmental permitting inspections actually pose a significant risk to the environment. It was felt that this is due to the high 'risks' on site as a result of poor operational management rather than the lower inherent 'hazards' associated with the SMEs' activities.

In terms of the difficulties identified with DoC in section 3, this study supports Hopkins' (1994) view that we need to think carefully about what we should be asking people to comply with. He explained that specific procedural requirements can be easier to comply with than outcome focused legislation. The interviews with management and site staff identified that SMEs have problems applying the “*reasonably practicable*” mantra associated with this type of legislation; this can make the legislation un-auditable from an SME's perspective.

Recommendations

There is a clear need for further study in the field of environmental compliance in SMEs.

Specific recommendations include: -

- SMEs need to improve their compliance control systems. They will need guidance and support in order to measure their compliance; this may best manifest itself in the development of environmental compliance performance indicators (CPIs).
- A more sophisticated SME screening process is necessary in order to help identify those organisations which can pose a higher risk to the environment. This needs to incorporate a more thorough investigation into the link between the EA/ local authority compliance assessment systems and the control of all other relevant environmental legislation in permitted sites.
- Compliance auditing should be expanded to determine if the approach can be extended to other environmental legislation as well as to other industry sectors.
- More research is needed into the impacts and effectiveness of environmental legislation by investigating the link between environmental compliance and environmental protection.

- Compliance auditing best practice guidance needs to be developed for each piece of environmental legislation; clearly setting out how compliance might manifest itself.
- Future research needs to involve local authority and EA officer activity as they inject meaning into official procedures.

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Using risk assessment mechanisms to regulate legislative compliance in SMEs. In Townshend, M. (Ed): Proceedings of *Waste 2008- Waste and Resource Management – A shared responsibility*. Stratford-upon-Avon, 16-17 September, Session 4, 137-148. The Waste Conference Ltd, Stanton-on-the-Wolds, UK. ISBN-10: 0-9539301-4-9

This paper evaluates the current risk-based approach to regulating compliance. It examines SMEs' current compliance levels and identifies future strategies for the improvement of environmental compliance control systems for SMEs.

The ideas and theories presented in this paper contribute to some of the discussion in the final results in Chapters 5 and 6.

See below for an edited copy of the paper.

Using Risk Assessment Mechanisms to Regulate Legislative Compliance in SMEs

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Abstract

Legal compliance and ‘better regulation’ have been the focus of a considerable amount of recent Government initiatives. Hampton (2005) suggested that part of the solution is to regulate business using a risk-based system- a system which is already used by the Environment Agency in England and Wales. The system has obvious flaws, aside from the fact that many industries and in particular many SMEs are not included under this permitting regime. Evidence suggests that approximately 80% of environmental incidents are caused by SMEs; however, many are not audited for compliance with any environmental legislation and thus non-compliances go unpunished. Roger (2007) explained that this is further compounded by a lack of resources for local authorities to enforce the ‘less hazardous’ activities in SMEs resulting in them only having the ability to respond to complaints. This paper evaluates the current risk-based approach to regulating compliance. It examines SMEs’ current compliance levels and identifies future strategies for the improvement of environmental compliance control systems for SMEs.

Introduction

See section 1.1 for an introduction to the subject.

Purpose of the study

This study builds on the findings of previous research conducted by Wilson *et al.*, (2007) and Wilson and Williams (2008). This paper aims to review the currently utilised risk assessment approach in the UK, including: an evaluation of how SME’s fit into this system, an examination of SME compliance levels and identifying future strategies for the improvement of environmental compliance control systems for SMEs.

This study is part of the EPSRC-funded Sustainable Urban Environment Waste Consortium programme.

Methodology

The research used previously developed environmental compliance assessment methodologies. The initial study (Wilson *et al.*, 2007) comprised of 36 environmental compliance audits covering a range of legislation in a variety of SME sectors from the NW of England, with a follow-up study (Wilson and Williams 2008) comprising of 5 environmental permit (then waste management licence) compliance audits from waste sites in the NW of England; an overview of the results has been included in section 4.

The audits used regulation-specific audit templates (RSTs) as aide memoirs. These additional features were incorporated into the 3 recognised stages of environmental auditing (i.e. pre-audit fact-find, audit [site visit, interviews, document reviews] and post-audit activities) as recommended by Moorman and Kirsch (1991) and Carter (2003) in order to further facilitate an environmental compliance audit approach.

Offences audit templates (OTs) were designed in addition to the RSTs so that where legislation was outcome focused (as often detailed in Acts of Parliament), offences could be determined in addition to where regulations were not met.

The interviews were conducted and recorded with members of management as well as individual members of site staff. The interviews with management and site staff lasted approximately 1 hr and 20 minutes respectively.

Risk Assessment as a Mechanism for Regulating Compliance

See section 2.6.1 for more information on the subject.

SME Compliance

The following sections outline the results from compliance audits conducted on (the then) EP OPRA and non EP OPRA sites.

Compliance with waste legislation

All 36 SMEs assessed were required to comply with Environmental Protection Act 1990 (EPA) (section 34) (as amended) and The Environmental Protection (Duty of Care) Regulations 1991 (DoC) (as amended). Overall, compliance with the EPA and the DoC Regulations was poor with compliance levels of 22% and 28% respectively, an observation supported by previous research (Bland *et al.*, 2004). In terms of the requirement “*to prevent the escape of waste*”, the audits identified several breaches. As expected, those SMEs handling the largest amounts of waste scored the lowest as there were more opportunities for mistakes (compliance varied from 25% to 90%). The non-compliances identified included escaping waste- an offence under section 33(1) (c) “*treat, keep or dispose of controlled waste in a manner likely to cause pollution of the environment or harm to human health*”.

Other key findings: -

- Only 25% of SMEs complied with the requirement to ensure that waste “*is transferred to an authorised person or for authorised transport purposes*”.
- Of the 72 transfers sampled, 54% had a WTN note ‘available’.
- Of the 72 transfers, only 36% of WTNs were signed by both parties (transferee and transferor) at the time of transfer, revealing the fact that many WTNs went unchecked on transfer. Most included the name and address of the transferor and transferee (36 out of 39) with all WTNs stating whether the transferor was the producer or the importer. However, just under half (46%) of WTNs were not produced or ‘available’ during the audits- all potential offences under section 34(5) (DoC Regulations) and section 34(6) (section 34(1) requirements).
- Only 22% of SMEs complied with the requirement to specify the quantity of waste (22%), those who did tended to specify broadly (i.e. “*1 skip*”) rather than stating volume or weight.
- Only 19% of SMEs identified the waste according to the correct List of Waste (LOW) code. Non-conformances included: failure to use any codes, use of the wrong codes and/or failure to identify all relevant codes.

- Only 10 of 36 sites (28%) met the requirement to keep WTNs for 2 years from the date of transfer.

In terms of compliance with The Hazardous Waste (England and Wales) Regulations (HWR) 2005, 78% were required to comply. Overall compliance with these regulations was poor, with a compliance score of 31%. When assessing compliance with the '*no mixing rule*', non-compliances were reported where mixing was evident during the audit, with results only able to provide a snap-shot. Of those sites producing hazardous waste (28 of 36), 50% were compliant under Part 4 of the HWRs.

Seventy-five percent of SMEs were required to notify their premises; despite this, only 37% were registered with the EA. In contrast, most SMEs were aware that they needed to use consignment notes, especially when compared with the same requirement for WTNs under DoC. Of the 16 consignments audited, 12 produced notes (although they were not necessarily completed correctly); of the other consignments, 2 used WTNs to record the removal of hazardous waste with 2 not producing any paperwork.

Other key findings: -

- Consignment notes (sections A and B for the producers) were not well completed (an offence under regulations 33-38), often failing to give the description of waste, details of where the waste was produced and where it was being consigned - a fact complicated by the carrier rather than the producer arranging and completing the paperwork.
- Producer, holder and consignor records (a register of the quantity, nature, origin and where relevant the destination, frequency of collection, mode of transport and treatment method) were not well kept. Producers only kept records of consignment notes rather than recording all the requirements as detailed above; as a consequence this was not complied with by any SMEs (0 of 28). None of the carriers audited (0 of 4) kept their records in a register (for 12 months) - all offences under Part 7 of the HWRs.
- The 200kg producer registration exemption caused a great deal of confusion; with many SMEs incorrectly thinking that the 200kg exemption applied to ALL sites rather than just those exempted- an offence under regulation 21 and 22 of the HWRs.
- The broadening of the definition of hazardous waste caused confusion as SMEs were unsure as to what waste was now classified as 'hazardous' especially if they were regarded as 'non-hazardous' under the old 'special' waste regime.

Compliance in waste SMEs

Overall, the audits and interviews showed that although knowledge and understanding was better on permitted sites (particularly due to the WAMITAB competence requirements), SMEs' compliance with specific permit conditions was poor. Of the 5 permitted sites audited, 3 operated under the 'old-style' licence and 2 were 'standard condition' licences. Compliance issues with comparable conditions have been outlined below: -

- The general feeling was that little attention was paid to the specific conditions with sites 'aiming' to operate in conjunction with the outcome of their EA inspections.
- Two of the 5 sites audited did not have adequate technical competence cover. One site's 2-year grace-period had lapsed and they were still in the process of completing the relevant qualification, the other non-compliant site had 'cover' however, no evidence of their site attendance was available.

- Sites generally complied well with infrastructure requirements such as impermeable hard-standing and sealed drainage, this was generally due to the fact that some of the sites were based on previously established waste sites where the infrastructure was already in place, moreover, hard engineering requirements were seen as being 'less negotiable' with the EA.
- Compliance with daily treatment and annual throughput limits were well met. This was primarily due to the fact that conditions were set well above operational levels and thus it would be impractical for them to be exceeded.
- Where it was possible and 'advantageous' to breach conditions, the 5 sites viewed this as acceptable as long as the situation was rectified once identified by the EA; this type of activity related to the acceptance and long-term storage of hazardous waste on non-hazardous sites.
- There were breaches of paperwork requirements on all 5 sites, for instance, in the 3 'old-style' licences (where site record requirements are much more explicit), site diaries were not well completed with 2 of the sites not regularly completing a diary and the 3rd site only partially recording the specified requirements. In terms of the standard condition licences, both sites were unaware of what an accident management plan consisted of although partial (albeit out-dated) working plans were in existence - The above constituted an offence under regulation 38(1) (b) of the new EPRs: "*to fail to comply with or to contravene an environmental permit condition*").

Discussion

The research indicates that although knowledge and understanding was significantly higher on permitted sites, compliance levels with the environmental legislation audited were low on both EP OPRA and non EP OPRA sites. This suggests that, if compliance can be linked to pollution then many more sites would be regarded as 'high' risk and as a result, risk assessments should consider compliance levels more thoroughly in their assessments.

The results demonstrate that the level of environmental risk is not necessarily consistent with the level of risk attributed by the EA and thus, because many SMEs are not considered a risk, they do not fit into the current risk agenda. It was felt that a large portion of those SMEs not covered by the EA environmental permitting inspections actually posed a significant risk to the environment. This was due to the high 'risks' on site as a result of poor operational management rather than the inherent 'hazards' associated with the SMEs' activities (which were recognised as being lower). This suggests that SMEs need to be more carefully considered when deciding 'risk' priorities, with sector type and size being too simplistic an assessment of an organisation's potential to pollute.

In terms of the link between the policy, science and practice of environmental risk assessment, it is clear the EA 'risk-based' policies and scientific principles are well established and lauded. However the practice of completing risk assessments does not seem to match the policy as there seems to be confusion between the application of the terms, 'hazard' and 'risk' which has resulted in well managed sites with high hazards being over regulated as well as poorly managed sites with lower hazards (but higher risks) being under regulated. This problem is exacerbated by the completion of generic hazard assessments which are then applied to all sites of similar size and function- this archaic approach to risk assessment has long since been recognised as inadequate in other areas such as health and safety. Thus, more site- and

management-specific assessments with an element of objectivity and detailed compliance assessment must be completed if 'risk' is to be properly identified and managed.

Conclusions and Recommendations

The paper concludes that although environmental risk assessment has its place and has been successful to a certain extent we need to be more careful about how risk is assessed and how and where the principles are applied to SMEs. It is felt that environmental compliance auditing could be used more effectively as part of determining risk on sites.

The following specific conclusions have been drawn from this research: -

- Compliance with specific environmental legislation was low on both EP OPRA and non EP OPRA regulated sites.
- The level of environmental risk in the SMEs audited is not necessarily consistent with the level of risk attributed by the EA and thus, because many SMEs are not considered a risk, they do not fit into the current risk agenda.
- It is suggested that a proportion of SMEs not covered under the EA environmental permitting system actually pose a significant risk to the environment. It was felt that this is predominately attributed to how the operations were managed rather than the inherent 'hazards' of the activities.
- Risk assessments need to be site- and management-specific as well as considering compliance as there is evidence that the EA assessments focus more on 'hazards' rather than 'risk' offering too simplistic and generic an assessment of site risk.
- There are inconsistencies in the application of the policy and science of risk assessment which has resulted in over-regulation on some site and under-regulation on others.
- A more sophisticated SME screening process is required in order to help identify those organisations which can pose a risk to the environment and in particular for those SMEs not currently part of an inspection regime.
- Risk assessments need to use compliance auditing as part of this screening process, offering a link between compliance and environmental protection.
- Risk assessors need better and more concise guidance, tailored towards measuring compliance; it is suggested that this may best manifest itself in the inclusion of compliance performance indicators (CPIs) in site risk assessments.
- There needs to be a more thorough investigation into the link between the EA/ local authority compliance assessment systems in order to ascertain how best to regulate the pollution causing activities in SMEs.

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4.2.5 Wilson, C, D, H; Williams, I, D and Kemp, S (2009)

Compliance with water legislation in waste management facilities: Experiences from UK small and medium sized enterprises. Proceedings of the Twelfth International Waste Management and Landfill Symposium. S. Margherita di Pula, Cagliari, Sardinia, Italy, October 5/9. Paper No. 354. ISBN 978-88-6265-007-6.

This paper investigated the legal compliance of SMEs with water legislation in UK waste management facilities. The paper sets out the results of compliance audits of legislation controlling oil storage, ground water protection and discharges to sewers and surface waters.

A total of 20 waste management SMEs from the north-west of England were audited. This paper refers to the research conducted as part of the author's final PhD submission and forms part of the discussion and conclusions in Chapters 5 and 6.

See below for an edited copy of the paper.

Compliance with Water Legislation in Waste Management Facilities: Experiences from UK Small and Medium-Sized Enterprises

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Abstract

This study investigated the legal compliance of SMEs with water legislation in UK waste management facilities. The research incorporated legislation controlling oil storage, ground water protection and discharges to sewers and surface waters. Compliance audits and SME management and site staff interviews were conducted utilising regulation-specific and environmental offences' audit templates. A total of 20 SMEs from the north-west of England were audited between April-September 2008. The research indicates: -

- Low to moderate levels of compliance with environmental permit conditions and water legislation; SMEs failed to comply with the 'letter' and 'spirit' of the law;
- There is a link between compliance and environmental protection, although, it was unclear as to the extent of this link; and
- SMEs considered compliance to be what the regulator identified rather than that detailed in legislation; further research is needed to identify the most efficient balance in regulator inspection frequency.

Introduction

See section 1.1 for an introduction to the subject.

Purpose of the study

The study builds on the initial findings from previous research conducted by Wilson *et al.*, (2007) and Wilson and Williams (2008). This work is part of a larger piece of research investigating a wide range of SME sectors' compliance with all major environmental legislation. The initial research comprised of 36 environmental compliance audits covering a range of legislation in a variety of SME sectors. This particular part of the study focused on UK SME compliance with water legislation in waste management facilities. The research incorporated the major pieces of UK water legislation, including the Water Industry Act 1991, the Water Resources Act 1991, The Control of Pollution (Oil Storage) (England) Regulations 2001 and The Groundwater Regulations 1998.

The overall aim of this follow-up study was to consider how we might improve the environmental compliance control systems for SMEs as well as making recommendations for further research for the management of SME compliance.

Methodology

The study utilised a previously developed methodology (Wilson *et al.*, 2008) in order to develop a more sophisticated and holistic approach to compliance auditing. The approach included the development and use of a novel compliance auditing methodology which incorporated the use of regulation-specific and environmental offences' audit templates as well as detailed interview questions for SME management and site staff. These additional features were incorporated into the 3 recognised stages of environmental auditing (i.e. pre-audit fact-find, audit [site visit and

document reviews] and post-audit activities) as recommended by Moorman and Kirsch (1991) in order to gain a full picture of individual SME compliance.

The environmental offences' audit templates were designed in addition to the regulation-specific audit templates so that where legislation was outcome focused (as often detailed in UK Acts of Parliament), offences could be determined in addition to where regulations were not met. Interviews were conducted and recorded with management as well as individual members of site staff. Interviews with management and site staff lasted approximately 1hr and 20 minutes respectively. A total of 20 SMEs from the north-west of England were audited between April-September 2008. Detailed compliance audits were conducted which considered water as well as environmental permitting legislation (known as waste management licensing at the time of the study).

Results

Compliance with Oil Storage legislation

Out of the 20 SMEs assessed, 10 were required to comply with **The Control of Pollution (Oil Storage) (England) Regulations 2001**. Although the use of oil was essential for vehicle fuelling and maintenance on all sites, some of the smaller SMEs were able to take advantage (inadvertently in most cases) of the “*storage capacity of 200 litres or less*” exemption in the regulations.

Table 4.5 shows how the different requirements of the regulations were divided up for the audit as well as to show overall compliance, whilst Table 4.6 shows the number of potential offences identified. The results show that compliance with the regulations was reasonably high except for the requirements relating to ‘secondary containment (bundling) for containers’ (43.8% compliance) and ‘containment (drip trays) for ancillary equipment, including fill pipes (25% and 0% respectively) - all offences under regulation 3 - “*general requirements for storage of oil*”. Compliance scores for ‘bund wall impermeability’ were inevitably low (43.8%), as containers with no bunding were automatically given a fail. Encouragingly, 100% of those containers with bunding were deemed to be adequate in terms of permeability. Compliance was generally better for ‘containers’ than ‘drums’ (71.4% compared to 53.2% for both general and specific requirements). It was felt that this was due to their fixed, permanent nature which made it more likely for company resource and infrastructure to be provided.

Overall, the audits indicated 63.3% compliance with individual components. When these results are compared with previous audits conducted in other sectors (manufacturing, printing, construction and the service industry), the waste industry did not rank highly; scores of ~80% were regularly recorded (Wilson *et al.*, 2007). However, these results should be interpreted with caution as higher scores (i.e. “*container strength*”) distorted the lower scores (i.e. “*secondary containment*”) and give an overall false impression that compliance was relatively high when actual compliance varied greatly within the regulations.

Only one of the 20 sites admitted to having any oil storage issues raised by the EA. This had previously resulted in a prosecution under the site’s waste management licence, as well as under the Water Resources Act 1991, as a pollution incident had actually occurred. None of the sites were aware of any (or further) pollution incidents as a result of oil being stored on site

despite the fact that audits identified oil spills/ ground contamination on 7 of the 10 sites. This indicates that the regulatory requirements were either not being identified by the EA or the regulations were not considered important enough in terms of pollution prevention.

Table 4.6 shows how the compliance audit scores could be converted into potential offences. A total of 65 potential offences were identified from the 16 oil containers (6 fixed tanks and 9 drums) on the 10 sites, an average of >6 offences per site and 4 per oil storage vessel. The majority of offences were caused under regulation 3 (48 of 65); this isn't surprising, considering that regulation 3 includes all the requirements relating to secondary containment and bunding for any equipment which is ancillary to the oil container/ drum. When compared with the actual number or potential pollution incidents, this study indicates that there is a link between non-compliance with the main requirements (i.e. 'secondary containment' and provision of 'drip tray') and the potential for groundwater/ water pollution. The significance of these pollution incidents varied, but the research showed that on many of the sites there was a potential threat to the environment but that it was unclear as to how severe this impact was.

As well as the more obvious compliance issues with the 'letter of the law', there were also significant 'spirit of the law' breaches. In particular, it didn't seem as if any of the SMEs had sought any official guidance in terms of the citing of the oil containers, for instance, on one site, there didn't appear to be adequate distance between the tank and bund wall (750mm is recommended) as well as adequate bund wall height (i.e. 150mm is recommended as a minimum).

A further significant spirit of the law issue related to management's and staff's poor awareness of the legislative requirements, with the vast majority of the affected SMEs not aware of the existence of regulations and even fewer aware of the requirements to ensure compliance. Eight out of the 20 sites were aware that bunding was a requirement under the Oil Storage Regulations but few were aware of any other specific requirement.

This lack of knowledge is compounded by the convoluted nature of the regulations which make them difficult to interpret and in some cases difficult to apply in practice. This is supported by the interviews, with 70% of SME managers feeling that the regulations were not fair on SMEs, despite most (75%) preferring regulations to be prescriptive rather than outcome based as they found them generally easier to understand.

SMEs were generally aware that oil was a dangerous pollutant with some aware that storage tanks had to be banded, however, few had a working knowledge of the regulations nor were they able to confidently confirm whether they were complying.

When questioned, most thought that since they only stored a few drums (205 litres in size) then the regulations would not apply to them. A number of sites thought that because they stored small amounts of oil the regulations wouldn't apply (even though this was stored in a container which can hold >200 litres). It had to be made clear that the regulations related to the potential capacity of the vessel and not the actual amount of oil stored within it.

The regulations state that for containers (other than drums), secondary containment must be of sufficient capacity to contain 110% of the total volume of the container. Where more than one container is stored in the secondary containment system, it should be capable of holding 110% of the largest container or 25% of the total, whichever is the greatest. For one drum, the secondary containment should be 25% of the drum's capacity or if more than one drum is in the

system it should be capable of holding 25% of the aggregate storage capacity of the drums. Of those SMEs affected, many thought that double skinned tanks provided adequate secondary containment; it had to be explained that this is not the case as these tanks do not prevent escape of oil if, for example, the tank is overfilled. In addition, the inappropriate use of the bund as a storage area for equipment and tools negated its use and thus had to be recorded as “non-compliant”.

The use of a building as a secondary containment unit was also questionable. Some SMEs felt that any storage of oil inside a building exempted them from the regulations. However, it was obvious (on several occasions) that the buildings used to store oil were not suitable to be described as secondary containment nor had they been adequately risk assessed for that purpose.

There were also issues concerning the definition of oil, many SMEs were unaware of what constituted ‘oil’ in the regulations; on several occasions SMEs seemed to anticipate that what they stored wouldn’t be covered by the regulations rather than seeking clarification.

A further issue concerned interpretation of the term ‘storage’, with some SMEs claiming that the oil was ‘in use’ rather than being stored and thus was not covered by the regulations (i.e. wrongly comparing their case to how fuel in vehicles is not covered by the regulations).

Compliance with Groundwater legislation

None of the sites audited operated under an authorisation which allowed them to release substances to groundwaters and thus, specific compliance against the requirements of any authorisation could not be assessed. However, since all 20 sites were involved in the receipt, storage and management of third party waste, possible pollution of ground waters was holistically covered in the site audit. Potential issues were identified on 7 of the 20 sites due to the storage of waste on unsealed ground and/ or the potential release of hydrocarbons due to the inappropriate storage of oil.

Regulation 14 of **The Groundwater Regulations 1998** (as amended) was identified as the relevant offence under section 85 (“*offence of polluting controlled water*”) of the Water Resources Act as a result of a release of a listed substance to ground waters. Similar to oil storage legislation, there was no specific knowledge by the SME managers of the substances that could not be deposited to ground nor was there any knowledge of the potential offences caused by releases of substances to ground waters. It is clear that more thorough inspection of these sites would have helped to prevent these pollution incidents.

Compliance with legislation concerning the discharge of substances to the sewer system

The **Water Industry Act 1991** controls the discharge of substances to the sewer system. These regulations are regulated by regional water companies rather than the EA. Of the 20 sites audited, only 2 had trade effluent discharge consents in place. Although no official samples were taken, the results show that both consents were being met. A summary of the compliance results for the two sites is provided in Table 4.7.

Of the 18 sites without trade effluent discharge consents, 7 were judged to be fully compliant due to the use of sealed drainage, on-site interceptor and/ or because all waste was contained inside the transfer station building, with no evidence of waste escaping. Of the remaining sites,

2 were identified as potentially causing ground water pollution as there was evidence of waste oil that had escaped adjacent to areas of the site where the concrete hard standing had become damaged and thus non-compliant with the site licence (these two sites were previously identified as potential causes of ground water pollution in section 3.2).

Two of the remaining 9 sites recently identified the need for a trade effluent discharge consent and were in the process of making this application; at the time of the audit, this had not been granted but the sites were still discharging trade effluent to the local sewer. Three of the sites did not have access to a local sewer and as a result, discharged trade effluent to the surface water system/ local water ditch - see section 3.4 for the relevant compliance issues raised.

The 4 remaining sites did not have any trade effluent discharge consent in place and there was evidence of the sewer system being potentially damaged due to the storage of waste outside (some of which was hazardous) and the presence of standing oil. Table 4 identifies the potential offences caused.

Again, knowledge of this legislation was poor with no sites able to identify the legislation controlling the release of substances to the sewer system. The only exception was on sites where trade effluent discharge consents were in place or were in the process of being applied for; only one of the managers involved had some knowledge of the basic requirements.

Compliance with legislation concerning the discharge of substances to the surface water system

The **Water Resources Act 1991** controls the discharge of substances to the surface water system. Unlike the Water Industry Act 1991, this is regulated by the EA. Only 3 sites directly or indirectly released substances to the surface water system. Two sites did this under a kind of 'tacit' consent from the EA, whereby trade effluent was released to a surface water ditch via an oily-water interceptor. The second site released trade effluent if after testing the samples meet critical limits. Both sites were generally felt to be compliant due to the use of an on-site interceptor and subsequent testing, however, there was a potential issue on the former site due to the fact that an internal interceptor tank was blocked and thus trade effluent was released outside the building with only the oily-water interceptor in place to prevent release of harmful pollutants to the local surface water ditch.

The third site did not have any consent in place, nor did they have a local sewer connection (except for domestic use). A condition in the site licence stated that all waste had to be stored outside, however, this was not the case and effluvia from recently deposited waste could be seen leaving the building and running into the local drain outside. The potential offences caused have been identified (Table 4.9; potential offences are bracketed to highlight the worse case scenario).

In terms of the spirit of the law, the level of knowledge and awareness was again poor, none of the sites were aware of the legislation, although 2 of the 3 sites did know that this was regulated by the EA and that a release of any pollutant would most likely result in a prosecution. Nevertheless, the sites were content to continue operating as usual rather than confirming the status of their informal consent with the EA.

Compliance with Environmental Permitting Legislation

Overall, although knowledge and understanding was better on permitted sites (particularly due to the Waste Management Industry Training and Advisory Board [WAMITAB] competence requirements under The Environmental Permitting (England and Wales) Regulations, 2007), SMEs' compliance with specific permit conditions was poor. Of the 20 sites audited, 16 operated under the 'old-style' waste management licence and 4 operated under the new 'standard condition' permit. Compliance issues with comparable conditions have been outlined below: -

- Little attention was apparently paid to the specific licence conditions with sites 'aiming' to operate in conjunction with the outcome of their EA inspections. Few of the SMEs could name any environmental legislation, with most referring to their waste management licence/ planning permission as the main piece of legislation, although this improved significantly when prompted; only 2 sites were aware of any water legislation.
- Six of the 20 sites audited did not have adequate technically competent management (TCM) in place. Five sites' 2-year grace-period (for gaining the appropriate level of competence under The Environmental Permitting Regulations) (at the time) had lapsed and they were still in the process of completing the relevant qualification. The sixth non-compliant site had technically competent 'cover'; however, there was no evidence of their site attendance available. The replacement of the old 'fit and proper person' requirement by a new reduced timescale requirement is likely to make a significant number of sites non-compliant.
- Sites generally complied well with infrastructure requirements such as impermeable hard-standing and sealed drainage; this was generally because some of the sites were located on previous waste sites where the infrastructure was already in place. In addition, engineering requirements were seen as being 'less negotiable' with the EA.
- Compliance with daily treatment and annual throughput limits were well met. This was primarily since conditions were set well above operational levels and thus it would be impractical for them to be exceeded. Overall, when asked, managers did not feel that the EA 'Opra' system effectively incentivised them to improve their operations on site. They did not feel that the EA inspections covered all environmental issues- there was generally mixed feelings in terms of the effectiveness of these inspections as managers did not want to encourage more inspections but still felt that more advice would be helpful.
- Where it was possible and 'advantageous' to breach conditions, sites viewed this as acceptable (and from a business point of view, necessary) as long as the situation was rectified once identified by the EA; this type of activity related to the acceptance and long-term storage of hazardous waste on non-hazardous sites. Two of the sites were immaculate and operated more like a manufacturing environment than a waste management facility.
- There were breaches of paperwork requirements on all 20 sites, for instance, in the sites operating under the 'old-style' licences (where site record requirements are much more explicit), site diaries were not well completed, with 15 of the sites not regularly completing a diary and the other sites only partially recording the specified requirements. In terms of the standard condition licences, 2 of the 4 sites were unaware of what an 'accident management plan' consisted of, although partial (albeit out-dated) working plans were in existence - The above constituted an offence under regulation 38(1)(b) of the new EPRs: "*to fail to comply with or to contravene an environmental permit condition*".
- Although, not a specific objective of this study, the audits identified several rudimentary failures under well established waste legislation, such as a failure to record and retrieve waste transfer notes and hazardous waste consignment notes. Nine of the 20 site managers had no evidence in terms of how they ensured their environmental compliance and none of

the sites measured their compliance. Six explained that they conducted checks as part of their site diary and 4 admitted to responding to EA inspections; in practice, the audits and interviews suggested that most responded to issues raised by the EA. This has implications considering the reduction in EA visits and the varying degrees of thoroughness.

Discussion

The audits and interviews with site staff and management suggested that there were mixed levels of compliance with UK water and environmental permitting legislation in the waste management sector. When asked, most SMEs seemed to be clear with what the term 'compliance' meant- "*meeting the letter of the law*", however, this was viewed extremely literally with little effort made to find out what these requirements actually meant. Although SMEs saw managing their environmental impact as being part of their site management/ health and safety role, in practice, few managers actually conducted specific environmental checks to support this.

The audits suggested that SMEs have a low appreciation and knowledge of environmental regulation and tend to base their compliance-related operational decisions on what others were doing, what they felt they could get away with as well as applying what they thought was common sense. These findings are similar to those of Smith *et al.*, (2000), Gunningham (2002), Bland *et al.*, (2004), Fairman and Yapp (2005), Ends (2007) and Wilson and Williams (2008) who also identify SMEs' low level of legislative awareness.

The audits have shown that many SMEs view their potential environmental impact in proportion to their size rather than how they manage their environmental impacts and although their individual environmental impact may be low, collectively they represent a large proportion of pollution instances in the UK (Hillary, 2000 and EA 2006). Most SMEs were not aware of what constituted an offence, and therefore, in the words of Petts (2000) were "*vulnerably compliant*". The research's observations support Petts' (2000) view that smaller firms' workers feel that things get tidied up prior to an inspection visit. Management also felt that self-regulation (such as The Environmental Protection (Duty of Care) Regulations, 1991) was an opportunity for the "*slacker*" companies to do nothing.

Prosecution and enforcement action as a result of non-compliances was low. This suggests that the regulatory authorities may not be implementing their enforcement policies as effectively as possible or they are not able to identify these non-compliances due to the infrequency or limited nature of their inspections. Interestingly, SMEs felt that the best way for them to demonstrate their compliance was for more frequent, face-to-face support (this is supported by Fairman and Yapp, 2005). These results also suggest that the EA did not consider compliance with certain regulations to be essential to ensure environmental protection and thus there was no need to prosecute.

Overall, there were significantly more breaches of environmental legislation than actual pollution offences; this doesn't necessarily indicate that some legislation was superfluous in terms of controlling pollution but it does indicate that it was easy to breach several pieces of legislation with only one lapse. Several sites were guilty of causing environmental pollution which was not necessarily detected by the EA and thus this indicates that if enforcement of environmental legislation was improved it would help to ensure environmental protection.

The interviews suggested that EA investigations were prompted by complaints rather than through the routine inspections. Hutter (1986) explained that complaints aren't necessarily the most reliable source of information as they are not necessarily prompted by the most serious offences; this is compounded by the fact that relying on the public to report offences is problematic as they do not possess the requisite knowledge to identify offences.

In terms of improving the environmental compliance control systems for SMEs, the results demonstrate that the level of environmental risk is not necessarily consistent with the level of risk attributed by the EA. It is quite possible that a large portion of those SMEs who are covered by the EA environmental permitting/ waste licensing system actually pose a more significant risk to the environment than is attributed by the EA. It was felt that this is due to the high 'risks' on site as a result of poor operational management rather than the actual 'hazards' associated with the SMEs' activities. Moreover, the EA seem to place less significance on general environmental legislation compared to that contained in the waste management facilities' environmental permits.

In spite of the above, this study supports Hopkins' (1994) view that we need to think carefully about what we should be asking people (businesses) to comply with. He explained that specific requirements can be easier to comply with than outcome focused legislation, although, where regulations are specific they need to be clear and practical to implement. The interviews with management and site staff identified that SMEs have problems applying the "*reasonably practicable*" ethos associated with this type of legislation; this can make the legislation un-auditable from an SME's perspective.

It is clear that some environmental legislation has a closer link to environmental protection than others. It is also evident that some environmental legislation is convoluted and difficult to interpret. This is supported by the fact that half of the SME managers thought that information on environmental management/ compliance was poor; 7 confirmed that they had not been made aware or seen any specific information and only 3 explained that they found the EA information useful. Similarly, enforcement of environmental legislation is lacking and is an important link between the utopian scenario of clear environmental legislation and a high level of environmental protection.

Conclusions

This research has been successful in determining compliance with water legislation in waste management facilities. The following key conclusions can be made: -

- Waste management SMEs have low to moderate levels of compliance with environmental permit conditions and water legislation (Table 4.5 and the section entitled "*compliance with environmental permitting legislation*"); SMEs failed to comply with the 'letter' and 'spirit' of the law with a number of offences identified (Tables 4.6, 4.8 and 4.9);
- The consequence of these low levels of compliance is a real or potential for environmental damage; although, it was unclear as to the extent of this damage, it demonstrates that there is a link between compliance and environmental protection;
- The interviewees identified that SMEs had poor awareness of environmental legislation and considered compliance to be what the regulator identified rather than that included in

legislation; this was viewed as an inevitable consequence of the complicated nature of some environmental legislation;

- SMEs viewed their potential environmental impact in proportion to their size rather than how they managed their operations on site;
- Despite most SMEs feeling that the regulations were overly-burdensome, the regulations did not seem to have a significant physical impact on the sites' audited as they did not initiate any significant changes to behaviour or on-site operations and:
- EA inspection frequency needs to be reviewed so that maximum effectiveness can be achieved – more research is needed to identify the most efficient balance in inspection frequency, so the point in which inspections no longer become effective (and actually become negative) can be identified.

It is not clear how the expansion of the Environmental Permitting system to include the 'water discharge consent system' among other things (as a result of the planned implementation of The Environmental Permitting (England and Wales) (Amendment) Regulations 2010) will improve the environmental compliance on waste facilities as this is more a change in process than in legal duty. However, an investigation into how the incorporation of the water consent system into the permitting regime is needed in order to determine if this will provide further protection for the environment.

Recommendations

This study indicates that there is a need for further research in the field of environmental compliance in SMEs. Specific recommendations include: -

- SME compliance control systems could be improved by developing a more sophisticated SME screening process to help identify those businesses which pose a higher risk to the environment despite their perceived low environmental impact.
- The development of environmental compliance performance indicators (CPIs) would significantly improve SMEs' ability to identify and monitor their own legal performance.
- Compliance audits need to be expanded to determine if the approach can be applied to other environmental legislation as well as to other industry sectors.
- More research is needed in order to ascertain the link between environmental compliance and environmental protection.
- More research is needed in order to develop a model to show the point in which regulatory inspections become most effective and when they cease to be effective.
- Compliance auditing best practice guidance needs to be developed for each piece of environmental legislation; clearly setting out how compliance might manifest itself.
- Future research needs to involve local authority and EA officer activity as they inject meaning into the compliance and enforcement process.

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Tables

Table 4.5 Compliance with The Control of Pollution (Oil Storage) (England) Regulations

Legislative Requirement	Compliance
<i>Number of (sites audited) [sites covered by the regulations]</i>	<i>(20) [10]</i>
<i>Number of separate (containers) [drums] on site</i>	<i>(7) [14]</i>
<i>Number bound by the regulations (containers) [drums]</i>	<i>(7) [9]</i>
Requirements for storage of oil – general (containers actual/ potential) [drums actual/ potential] % are unbracketed	
Container of sufficient strength	(7/7) [7/9] 87.5
Secondary containment ¹	(5/7) [2/9] 43.8
Steps taken to minimise any risk of damage by impact as far as is reasonable practicable	(7/7) [7/9] 87.5
Base and walls are impermeable ²	(5/7) [2/9] 43.8
Base/ walls are not penetrated by any valve or pipe used for drainage	(6/7) [9/9] 93.8
Pipes/ draw off pipes sealed (if penetrating base or walls)	(6/7) [9/9] 93.8
Valve, filter, sight gauge, vent pipe or other ancillary equipment situated within the bund (other than fill pipe, draw-off pipe & if oil with flashpoint <32 ^o C a pump)	(2/7) [2/9] 25
Drip tray provided for fill pipe	(0/5) [0/7] 0
Fixed tanks (container actual/ potential) % unbracketed	
<i>No. of sites with fixed tanks (actual no. sites) [no. of tanks]</i>	<i>(7) [7]</i>
Sight gauge supported and fitted with a valve	(3) [3] 100
Fill/ draw off pipe positioned to minimise risk of damage by impact	(7) [7] 100
If fill pipe above ground it must be properly supported	(7) [7] 100

Legislative Requirement	Compliance
Underground fill pipe requirements	(0) [0] -
Protection from corrosion (if tank made from corrosion liable materials)	(5) [7] 71.4
Tank fitted with an overflow prevention device (if relevant)	(0) [0] -
Screw fitting (in good condition) used when tank is being filled	(0) [0] -
Flexible pipe requirements (if relevant)	(0) [7] 0
Pump requirements (if relevant)	(3) [6] 50
Permanent vent, pipe, tap, valve requirements (if relevant)	(7) [7] 100
Mobile Bowers (drums actual/ potential) % unbracketed	
<i>No. of sites with mobile tanks (actual no. sites) [no. of tanks]</i>	(6) [9]
Taps or valves for discharging must be fitted with a lock and be locked when not in use	(4) [5] 80
Flexible pipes requirements when permanently fitted to the old storage unit	(0) [4] 0
TOTAL COMPLIANCE WITH THE REGULATIONS %	119/184 63.3%

¹As required by the regulations, depending on size and number of containers or drums

²Where no bunding was present, sites were recorded as non-compliant

Table 4.6 Potential offences under The Control of Pollution (Oil Storage) (England) Regulations

Offence No.	Description	No. of offences
	A person who has custody or control of any oil in circumstances in which there is a contravention of any provision of regulations 3 to 5 or the requirements of a notice under regulation 7 shall be guilty of an offence.	
Regulation 3	Requirements for storage of oil – general See Oil Storage Regulations for requirements	48
Regulation 4	Fixed tanks See Oil Storage Regulations for requirements	12
Regulation 5	Mobile bowers See Oil Storage Regulations for requirements	5
Regulation 7	Notices to minimise pollution risks in transitional cases These traditional cases no longer apply	-
TOTAL		65

Table 4.7 Compliance with Trade Effluent Discharge Consents

Compliance by SME sector Legislative Requirement	Compliance
<i>No. of companies (requiring consent) [no. in place]</i>	(8) [2]
Compliance with Trade Effluent Discharge Consent	
Nature of discharge	(2) [2]
Sewer affected	(2) [2]
Connections	(2) [2]
Maximum volume of discharge	(2) [2]
Matters to be eliminated prior to discharge to sewers	(2) [2]
Matters to be limited prior to discharge to the sewer	(2) [2]
Temperature	(2) [2]
pH value	(2) [2]
Inspection chamber	(2) [2]
TOTAL COMPLIANCE WITH REGULATIONS (%)	100

Table 4.8 Potential offences under the Water Industry Act

Offence No.	Description	No. of offences
Section 111	Injuring the sewerage system (there is a defence of acting under a consent)	6
Section 118	It is an offence to discharge any trade effluent from trade premises (as defined in section 141) into sewers unless a trade effluent consent is obtained from the sewerage undertaker.	6
Section 121	Breaching a consent	-

Table 4.9 Potential offences under the Water Resources Act

Offence No.	Description	No. of Offences
Sections 85(1)	Offences of polluting controlled water Causing or knowingly permitting any poisonous, noxious or polluting matter or any ("solid" [omitted by the EP Regulations]) waste matter to enter any controlled waters "waste" is defined as set out in Directive 2006/12/EC as amended by the EP Regulations.	1 (3)
Section 85(3)	Discharging trade or sewage effluent without consent	1 (3)
Section 85(5)	Substantially aggravating pollution by impeding the proper flow of inland, non-tidal waters	-
Section 85(6))	It is an offence to breach any conditions attached to a consent	-
Section 87	Discharges into and out of public sewers Relates to responsibilities for sewerage undertakers.	-
Section 217(3)	Criminal liabilities of directors and other third parties. This makes it an offence if a breach of any of the water pollution offences is due to the act or default of some other person.	-

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4.2.6 Wilson, C, D, H; Williams, I, D and Kemp, S (2010)

Compliance with Producer Responsibility Legislation: Experiences from UK Small and Medium-Sized Enterprises. Business Strategy and the Environment. DOI: 10.1002/bse.698.

This paper presents results from compliance audits of producer responsibility legislation. The research incorporated legislation controlling packaging and packaging waste, waste electrical and electronic equipment and the restriction of the use of certain hazardous substances in electrical and electronic equipment.

This paper refers to the research conducted as part of the author's final PhD submission and forms part of the discussion and conclusions in Chapters 5 and 6.

See below for a full copy of the paper.

Compliance with Producer Responsibility Legislation: Experiences from UK Small and Medium-Sized Enterprises

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Abstract

This study investigated the legal performance of UK SMEs with producer responsibility legislation. The research incorporated legislation controlling packaging and packaging waste, waste electrical and electronic equipment and the restriction of the use of certain hazardous substances in electrical and electronic equipment. Compliance audits and interviews were conducted with SMEs, regulators, Government officials and SME support organisations. A total of 44 SMEs from the north-west of England were audited between April-September 2008. The study's findings suggest:

- Low levels of 'letter of the law' and 'spirit of the law' compliance.
- Enforcement activity and surveillance of SME compliance was generally low; there has not been any formal enforcement action taken under The WEEE Regulations, The RoHS Regulations and enforcement under The PER Regulations is extremely low.

Recommendations on how to improve SME compliance control systems are provided.

Introduction

It is logical to assume that compliance with environmental legislation is necessary in order to ensure environmental protection. However, it has been suggested that over-regulation can have a detrimental impact on economies (Ainley, 2005) and the link between compliance and environmental protection has been questioned. Although there is evidence that regulation does not inhibit economic growth (Williamson *et al.*, 2006b and White and Parasher, 2007); clearly, there needs to be a balance between over-implementation and enforcement of legislation and ensuring that harm to the environment is minimised.

In the UK, there has been considerable investment and commitment towards achieving what has become known as 'better regulation'. In particular Hampton (2005) and what was then the Better Regulation Commission (replaced by the Better Regulation Executive) highlighted the need for more strategic thinking when it comes to formulating and disseminating regulation. Hampton suggested that part of the solution is to regulate business using a risk-based model. The Environment Agency (EA) in England and Wales already claim to use a 'risk-based' system in the regulation of legislation it is responsible for enforcing (IEMA Practitioner, 2005).

This paper focuses on compliance with 'producer responsibility' legislation and the other associated enforcement bodies: the National Measurement Office (NMO), Vehicle Certification Agency (VCA) and Local Authority Trading Standards (TS) share this view on the use of a risk-based system. However, there has been criticism from some commentators who suggest that certain legislation, including that researched in this study have not been successfully enforced (Benson *et al.*, 2006, Letsrecycle.com, 2007 and LACORS, 2009). This is supported by other studies that have compared compliance rate and enforcement data (Bland *et al.*, 2004; Fairman and Yapp, 2005, the OECD (2004); Wilson and Williams, 2008 and Wilson *et al.*, 2007).

Better regulation is termed "*modern regulation*" by the EA (2006) and its aim is to drive environmental improvement. However, it is perceived by the authors that the 'forced' nature of some risk-based systems (i.e. risk assessments are being used to justify rather than inform the level of inspection required) has reduced the number of inspections to a point where it has become detrimental to ensuring compliance. Moreover, a reduction in the number of inspections has resulted in more 'pressure' being put on the remaining inspections and thus there is now

less opportunity to identify non-compliance as well as promote the regulator's role (Bell and McGillivray, 2006 and Ends, 2003). In addition, those businesses not included under environmental permitting or direct regulatory regimes are unlikely to be audited for compliance against any environmental legislation; consequently a significant portion of **all** businesses go un-inspected and uncontrolled (Gunningham, 2002).

In contrast, the consensus from the business community is that they are **over-regulated** and inspected unnecessarily (Ehmann, 2007, Hampton, 2005 and Ainley, 2005). Although there has been a great deal of influence from the European Union (EU), very little quantitative data has been published on compliance with environmental legislation, in particular compliance with producer responsibility legislation. Much of this is because it is difficult to determine compliance (Wilson and Williams, 2008), with regulators' prosecution and enforcement action not truly reflecting compliance rates (Bland *et al.*, 2004).

Small and medium-sized enterprises (SMEs) in particular face difficulties complying with environmental legislation as they are expected to obey a vast range of environmental legislation with little to differentiate their workload from that of larger, more resource-rich companies. These difficulties have resulted in SMEs demonstrating low levels of awareness and understanding of environmental issues as well as low levels of compliance (Bland *et al.*, 2004, Fairman and Yapp, 2005, Wilson *et al.*, 2007, Taylor/ YouGov, 2007, Atkins, 2007 and Wilson and Williams, 2008). This is a sensitive political issue because SMEs are vital to the UK economy; they account for 99.7% of businesses (totalling 4.7 million), 47.5% of employment and generate 48.7% of turnover (Richard, 2007). They are defined as businesses employing <250 members of staff, having a turnover of <€50 million and/ or an annual balance sheet of <€43 million (European Commission, 2006). Despite their individual small scale, SMEs can have a huge collective impact on the environment - the EA suggested that up to 80% of environmental incidents are caused by SMEs (this is supported by Hillary, 2000, Williamson *et al.*, 2006 and Fairman and Yapp, 2005). However, anecdotal evidence suggests that regulatory authorities concentrate their efforts on larger organisations that are perceived to have a higher potential to pollute.

Fay (2000) identified the problems SMEs have in dealing with issues such as profitability, competitiveness and staffing; resulting in environmental issues being neglected. Because of the sheer number of SMEs, there needs to be an effective system of regulation which controls activities and targets those businesses that pose a high risk to the environment.

Producer Responsibility

In Europe, 'producer responsibility' as a policy tool is an extension of the 'polluter pays' principle. It aims to ensure that businesses who place products on the market take responsibility for those products once they have reached the end of their life. In particular, producer responsibility has been the policy approach taken in terms of managing waste products, with the aim that it would filter back along the product's life cycle and drive resource efficiency throughout.

Producer responsibility can be viewed as 'extended' or 'individual'. Extended Producer Responsibility (EPR) is "*an environmental policy approach in which a producer's responsibility for a product is extended to the post-consumer stage of a product's life cycle*" (OECD, 2001, 9). Individual Producer Responsibility (IPR) is "*a policy tool that provides incentives to producers for*

taking responsibility of the entire lifecycle of his/her own products, including end of life” (ERP, 2007).

Producer responsibility policies underline the approach taken in managing: Packaging and Waste Packaging, Waste Electrical and Electronic Equipment (WEEE), End of Life Vehicles (ELV) and Batteries and Accumulators. The applicable EU Directives covering the above waste streams clearly place responsibility on producers to bear the costs of collection, sorting or treatment and recycling or recovery. Overall, the UK Government wants to see a more sustainable approach to resource-use and a reduction in the quantity of waste going to landfill, by diverting end of life products for re-use, recycling or other forms of recovery (Defra, 2007).

As well as meeting statutory requirements, producer responsibility incentivises producers to design products in a way that uses fewer resources, reduces or eliminates the amount of hazardous substances, increases the amount of recyclate used in manufacturing and allows for reuse and for recycling when the product comes to the end of its life.

Packaging and Packaging Waste

The 1994 European Parliament and Council Directive on Packaging and Packaging Waste (94/62/EC) and subsequent 2004 Directive (2004/12/EC) aimed to harmonise the management of packaging waste in the EU and tackle the impact that such wastes have on the environment. The primary objective was to increase the recovery and recycling of packaging waste in all EU Member States. Priority was also given to reducing the amount of packaging used and the reuse of packaging.

The original 1994 EU Directive was implemented and the concept of ‘producer responsibility’ introduced in the UK via ss. 93-95 of the Environment Act 1995 which allowed the Secretary of State to make regulations for imposing producer responsibility obligations.

The 1994 Directive and the requirements of the Environment Act 1995 were originally transposed in England, Scotland and Wales through The Producer Responsibility Obligations (PRO) (Packaging Waste) Regulations 1997 (as amended). The PRO Regulations were consequently revoked and replaced by 2005 regulations of the same name as a result of amendments made by the 2004 EU Packaging Directive. The PRO Regulations 2005 have been subsequently revoked and replaced by The PRO Regulations 2007 (as amended) which apply to the whole of Great Britain.

The PRO Regulations 2007 place responsibility for achieving national recycling and recovery targets on those involved in the ‘packaging chain’; collectively known as ‘packaging producers’ – according to the EA approximately 5,500 businesses in England and Wales are obligated (EA, 2010). Producers can choose to carry out their obligations individually or register with a compliance scheme, which will then complete the obligations on the producer’s behalf. The obligations require producers to purchase evidence (known as Packaging Recovery Notes-PRNs) to show that specified tonnages of packaging waste are recovered and recycled each year and to certify that this recovery and recycling has been achieved. Packaging producers handling more than 50 tonnes of packaging per annum and having a turnover of more than £2m per annum are obligated. In England and Wales, The PRO Regulations are ‘directly’ enforced by the EA.

Although not deriving out of the 'producer responsibility' remit of the Environment Act, The Packaging (Essential Requirements) (PER) Regulations 1998 were made in order to satisfy requirements laid down in the original 1994 Directive on Packaging and Waste Packaging. The PER Regulations 1998 were revoked and replaced by the PER Regulations 2003 (as amended in 2004 and 2006).

The PER Regulations 2003 require businesses that produce packaged products, design or specify packaging, import packaged goods into the UK, sell packaged goods or place packaging 'on the market' to meet certain 'essential requirements' and to not exceed minimum heavy metal concentrations. The essential requirements state that:

- packaging volume and weight must be the minimum to maintain necessary levels of safety, hygiene and acceptance for the consumer;
- packaging must be manufactured so as to permit reuse, recycling or recovery and if disposed of, have minimal environmental impact;
- noxious or hazardous substances in packaging must be minimised in emissions; and
- aggregate heavy metal limits apply to cadmium, mercury, lead and hexavalent chromium in packaging or packaging components.

In England and Wales, The PER Regulations are enforced by Local Authority Trading Standards.

WEEE and RoHS

The Waste Electrical and Electronic Equipment (WEEE) Directive (2002/95/EC) and the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) Directive (2002/96/EC) were introduced across the EU in 2002. In the UK, the WEEE and RoHS Directives were implemented through The WEEE Regulations 2006 (as amended) and The RoHS Regulations 2005 (replaced and revoked by regulations of the same name in 2008; as amended).

The WEEE Regulations apply to importers, producers, retailers, end users of electrical and electronic equipment (EEE) and to those that treat or recover WEEE. The regulations aim to reduce waste from EEE, encourage the separate collection, treatment and recycling of WEEE, make producers of EEE financially responsible for their safe disposal and improve the environmental performance of all those involved during the lifecycle of EEE. In England and Wales, The WEEE Regulations are enforced by the EA and VCA; some elements are directly enforced, whilst others are not.

The RoHS Regulations aim to limit the environmental impact of EEE when it reaches the end of its life. It does this by limiting the amount of hazardous substances that can be used in the manufacture of new EEE placed anywhere in the EU. RoHS affects those who manufacture or import EEE, export EEE to other EU Member States, Liechtenstein or Iceland or rebrand EEE as their own product. In the UK, The RoHS Regulations are enforced by the NMO.

Purpose of the study

The study builds on and complements the findings from previous research conducted by Wilson *et al.*, (2007), Wilson and Williams (2008) and Wilson *et al.*, (2009). This work is part of a larger

piece of research investigating a wide range of SME sectors' compliance with all major environmental legislation.

This part of the study focused on UK SME compliance with producer responsibility legislation across 5 business sectors. The study incorporated 4 major pieces of UK producer responsibility legislation, including The Producer Responsibility Obligations (Packaging Waste) Regulations 2007 (as amended); The Packaging (Essential Requirements) Regulations 2003 (as amended); The Waste Electrical and Electronic Equipment Regulations 2006 (as amended) (incorporating the WEEE permitting requirements of The Environmental Permitting [England and Wales] Regulations 2007) and The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2008 (as amended).

The overall aim of the study was to determine and evaluate the level of compliance in SMEs with producer responsibility legislation. The findings are intended to inform future policies and strategies that address the impact and effectiveness of environmental legislation as well as suggest how we might improve environmental compliance control systems for SMEs.

Methodology

The study used a previously developed methodology (Wilson *et al.*, 2008) which details a sophisticated and holistic approach to compliance auditing. The approach included the development and use of a novel compliance auditing methodology which incorporated the use of **regulation-specific** and **environmental offences'** audit templates in addition to detailed semi-structured interviews with SME management and site staff as well as regulator, policy writers and SME support organisations. The interviews were guided by a pre-written prompt sheet, although discussion was allowed to flow; interviews were recorded/ transcribed as well as compared with site audits conducted to ensure accuracy. This approach is an accepted method as described by Fink (2003), Bergy (2004) and Holbrook *et al.*, (2003).

The audit templates were incorporated into the 3 recognised stages of environmental auditing (i.e. pre-audit fact-find, audit [site visit and document reviews] and post-audit activities) as recommended by Moorman and Kirsch (1991) in order to gain a full picture of individual SME compliance.

The environmental offences' audit templates were designed in addition to the regulation-specific audit templates so that where legislation was outcome focused, offences could be determined in addition to where regulations were not met.

The interviews with management and site staff lasted approximately 1hr and 20 minutes respectively. Interviews of up to 1 hour were also conducted with regulatory authorities involved in the enforcement of producer responsibility legislation, including the EA, TS and the NMO. Further interviews were conducted with DEFRA Policy officials as well as a number of SME and Local Authority support organisations such as the Chamber of Commerce, The Local Better Regulation Office (LBRO) and The Local Authorities Coordinators of Regulatory Services (LACORS). It was felt that the combination of the above research triangulation methods helped to ensure the accuracy of the results. In total, 44 businesses were audited in the north-west of England between April-September 2008.

Results

Compliance with The PRO Regulations

Of the 44 SMEs assessed, 4 (2 manufacturers and 2 printers) were obligated under the regulations. Six further businesses were classified as 'handling' packaging, 2 were exempt as they handled <50 tonnes of packaging per annum and a further 4 were exempt by virtue of their <£2m turnovers.

Table 4.10 shows compliance against the different requirements and Table 4.11 shows the number of potential offences identified.

The results show that compliance with the regulations was very poor with the 4 obligated businesses not able to demonstrate compliance with any of the requirements. The key offences identified in Table 4.11 relate to a failure to register with the EA or a producer compliance scheme and a failure to recover and recycle packaging waste.

When interviewed, the obligated SMEs admitted not having any knowledge of the regulations nor of what they needed to do to ensure compliance (although one non-obligated SME had worked out its obligation). Moreover, there was evidence in one SME that a member of senior management was actually aware of the regulations from previous employment but was deliberately ignoring them: "*we know that the regulations apply to us, but we're not going to do anything unless we are forced to*".

Despite this, none of the SMEs had received any information or formal enforcement action from the EA about compliance, nor had they been visited or inspected in order to determine compliance. This indicates that the regulatory requirements were not being identified by the EA and thus, where businesses are not forthcoming with compliance failures and/ or where this is not identified in outcome-based actions it is likely that many more businesses are failing to comply with the regulations.

Three interviews were conducted with the EA and in general, enforcement of these regulations was described as being "*robust*". Anecdotal evidence supports this as packaging prosecutions make up a significant number of the total EA prosecutions (the EA don't keep a list of prosecutions by type on its website). However, the compliance rates and knowledge suggest that non-compliance is much higher.

The EA explained that it puts the majority of its resources into going after potential "*free-riders*" rather than looking to check or inspect those SMEs who are already registered or indeed those following the small business allocation method. This suggests that a significant part of the regulations aren't audited with the EA putting faith in the producer compliance schemes to ensure compliance with individual requirements.

The EA acknowledged that the regulations were complicated and that information could certainly be made clearer; stating that "*the biggest problem for businesses is understanding and working out the obligation*". The EA also acknowledged that failure to meet one requirement often resulted in several requirements not being met: resulting in some businesses racking up non-compliances if they made one mistake.

Compliance with The PER Regulations

Of the 44 SMEs assessed, 11 were obligated (8 manufacturers and 3 printers). Table 4.12 shows compliance against the different requirements and Table 4.13 shows the number of potential offences identified.

The results show that 'letter of the law' compliance was very good with overall compliance over 90%. However, in some cases, several aspects of the regulations could not be specifically determined and/ or there was not sufficient evidence to raise a non-compliance (i.e. 'heavy metal concentrations' and response to 'requests for technical documentation').

In terms of the '**general duty relating to the placing of packaging on the market**', the requirement relating to the manufacturing and composition of packaging was considered to be the key requirement. The other various elements of this regulation were considered holistically.

Overall, there was 82% compliance with this requirement. Potential non-compliances related to a failure to reduce the packaging to minimal amounts; none of the sites were aware of this requirement. Although 1 SME was aware of the regulations, it was not aware that packaging had to be minimal.

All 11 SMEs were deemed to be complaint with the duty relating to '**concentration levels of regulated metals present in packaging**'; there was no evidence to suggest that heavy metal concentrations had not been met. Despite this, only one of the 11 SMEs was aware of the requirement and none of the SMEs were able to fully confirm that the packaging it placed on the market met the heavy metal concentrations. The only SME to be aware had asked some (but not all) of its packaging suppliers for confirmation.

The regulations restrict the concentrations of heavy metals (lead, cadmium, mercury and hexavalent chromium) to 100 ppm (parts per million by weight) (from 2001). Although it was felt that generally the different types of packaging used (mainly wooden pallets, cardboard, paper various types of plastic) would not exceed the ppm concentrations, there was little or no evidence or testing to verify this and thus compliance could not be wholly proven. Although, testing is not specifically required nor defined in the regulations, the SMEs failed to consider that treatment or painting of packaging may mean the application of heavy metals such as cadmium, lead or hexavalent chromium. As a consequence, testing should include samples that are representative of and proportional to all constituent materials used.

None of the 11 obligated businesses had received any specific '**requests for technical documentation**' and thus it was not possible to determine compliance with this requirement. It is not clear from the regulations when businesses are required to compile this technical information. Official government guidance (implicitly) suggests that it can be complied when an official request is made rather than having to be compiled as the packaging is placed on the market (BERR, 2007a). Although, this was recommended as good practice and thus, 'spirit of the law'.

Overall, only one of the 11 obligated businesses had identified its packaging supplier and compliance. An internal check identified that the company used 3 suppliers, with 2 of these being introduced since the last review. This was identified as a weakness in the company's procedures as there was no method of identifying when a new packaging supplier is introduced. The company has since introduced a standard letter requesting confirmation from its packaging

suppliers that the materials supplied comply with the heavy metals restrictions. Only one of the SMEs was aware that the regulations stipulate that the information received from the suppliers must be maintained on file for a minimum of 4 years.

Overall, knowledge of the regulations was extremely poor, with only one site being aware of their existence. None of the sites had completed any testing in terms of ensuring heavy metal content and only one site had generated evidence or made any attempt to try and confirm compliance. In consideration of this and the above observations, compliance with the 'spirit of the law' was poor.

Although, 'letter of the law' compliance was good, the lack of enforcement activity and the resultant lack of knowledge by SMEs is significant. None of the SMEs interviewed had received any proactive enforcement contact or action from regulators. This research reflects national enforcement activity which shows that since the regulations were introduced in 1998, there have only been 6 prosecutions.

This is supported by TS who called for tougher laws on excess packaging in order to crack down on companies using too much packaging to sell goods to householders (Letsrecycle.com, 2007). Officers responsible for enforcing the regulations say that there are too many loopholes in the regulations and that maximum fines (£5,000) were too low to provide a deterrent. This is supported by LACORS (2009) and the packaging industry who emphasise the lack of enforcement and who suggest that retailers should be faced with tougher legislation, since packaging firms provide their products to the retailers' specifications.

The Local Government Association (LGA) said that it was hard for TS to prove in court that packaging is unnecessary when companies claim the need for the packaging for "*marketing purposes*" and that they justify excess packaging on the basis of "*consumer acceptance*". An LGA representative said that the "*law obviously isn't working*" (Letsrecycle.com, 2007).

A significant issue with the regulations seems to be a lack of clarity – the regulations fail to define a number of terms, including "*noxious or hazardous substances*", "*testing*" as well as there being a conflict between keeping packaging "*minimal*" and meeting "*consumer acceptance*".

A follow-up interview was conducted with a north-west based TS office. The interviewee outlined that the regulations were "*environment driven*" but not "*compliance driven*" and consequently very few prosecutions had occurred. When asked about what support was provided to SMEs, the Trading Standards Officer (TSO) explained that it had conducted promotions around Christmas for instance but that this didn't seem to have much affect on those putting packaging on the market. Moreover, the TSO explained that they didn't have any information on their website about packaging regulations (at the time of the interview) even though there were ~500 businesses in their area that could be affected.

The TSO explained that meaning of "*customer acceptance*" is a key issue, i.e. packagers and sellers can use the argument that additional packaging is needed to make a product sell and that this is 'acceptable' to the consumer and thus compliant. The TSO felt that this provides businesses with a significant "*get out clause*" and that this part of the legislation should be changed. To improve this, the TSO suggested that businesses should have to justify why their packaging 'meets the minimum adequate amount for the product' rather than this being reversed and businesses being able to hide behind 'consumer acceptance'.

The TSO explained that the phrase: “*packaging should be designed to permit its recovery*” also brought difficulties, as it was difficult to prosecute if a local authority recycling scheme was in place. This is compounded because recycling schemes vary throughout the country, with inevitably, every item of packaging being capable of being recycled somewhere.

The interviewee acknowledged that TS could and perhaps should do more to support the implementation of the regulations. The TSO explained that a key task was to contact all affected businesses in each local authority area. When asked about the regulations themselves, the TSO felt they were relatively easy to understand and that they were fairly short and prescriptive but that there were some areas that needed to be amended to make enforcement practical.

The TSO explained that it didn't do any heavy metal testing. There had been no prosecutions in their County and only 4 in the UK between 1999 and 2008; overall, the TSO admitted that enforcement wasn't working! The TSO felt that they only had the resources to respond to complaints about excess packaging and in general, complaints related to the value of the product from the consumer point of view rather than on the amount of packaging. The TSO outlined that in their County, there are 12 individuals who have to cover all trading standards legislation, not just that which is environment-related. This lack of resources and the perception that prosecutions are very hard to enforce has led to the regulations not being prioritised within TS.

Compliance with The WEEE Regulations

All 44 SMEs were required (to varying degrees) to comply with these regulations; there are no exemptions in the WEEE Directive for SMEs. Of the SMEs audited, 1 was classified as a producer of EEE, 1 as a distributor, 6 as storing/ treating WEEE under a permit or exemption and all 44 SMEs as business end users. Even though the storage and treatment requirements of the WEEE Directive were transposed into England and Wales via The Environmental Permitting (England and Wales) Regulations (EPR) 2007, rather than the WEEE Regulations, they have been included here for completeness.

Table 4.14 shows compliance against the requirements and Table 4.15 shows the number of potential offences identified. Although, the results show that 'letter of the law' compliance was poor with overall compliance at 29%, this was mainly due to poor scores for SMEs obligated as business end-users; in general, the SME classified as producer and/ or those treating WEEE generally met their obligations.

The SME classified as a producer under the legislation met all but 3 of the producer registration requirements. The regulations not met included:

- Marking EEE with the crossed out wheeled bin symbol.
- Marking EEE with a producer identification mark and date mark.
- The provision of information on new types of EEE.

Under the regulations, producers are required to:

- Join a Producer Compliance Scheme (PCS).
- Provide data on EEE put on the market.
- Finance any costs of collection, treatment, recovery and disposal of WEEE in line with their notified obligation.

- Ensure the marking of EEE put onto the UK market to assist with its separate collection at the end of its life.
- Make information available to treatment facilities in respect of new types of EEE they put on the market (BIS, 2007).

The SME classified as a distributor (business to consumer) was not aware of its obligations under the regulations and had made no effort to comply and thus failed to meet any of the distributor requirements. The main obligation on distributors is to provide a take-back service to householders enabling them to return their WEEE free of charge. The regulations provide a choice of providing "in-store" take-back, participating in the Distributor Take-back Scheme (DTS), or providing an alternative system for free take-back for householders. Distributors also need to provide consumers with information on the options that are available to them for the free return of their WEEE (and retain records of WEEE returned by householders) and on the environmental benefits resulting from its separate collection.

Businesses storing/ treating WEEE are required to both register and comply with the conditions associated with an exemption or meet the requirements of a full Environmental Permit. Of the 6 SMEs obligated, 3 stored WEEE under a paragraph 41 exemption (under The EPR 2007) and 3 operated as Approved Authorised Treatment Facilities (AATF).

Paragraph 41 permits the secure storage of WEEE and all 3 sites storing WEEE had registered the exemption with the EA. In general, the 3 SMEs complied well with the requirements except for the conditions relating to the 'type of containment', whereby SMEs were required to ensure that WEEE was stored on impermeable surfaces and with a weatherproof coating. All 3 SMEs were guilty of incorrect storage amounting to WEEE being stored outside or on unsealed hard-standing.

Moreover, all 3 SMEs stored hazardous WEEE, including fridges and fluorescent tubes and there was evidence of fridge/ freezers being stacked in units of greater than 2 as well as fluorescent tubes not being stored in such a way as to prevent the glass being broken.

The 3 registered AATFs were all able to provide evidence that they reported to the EA. However, there was evidence that these reports were not delivered on time and in many cases management of the AATFs were not able to adequately explain the reporting requirements. There were also obvious cases of the site environmental permits being breached (WEEE not being stored under cover) and basic Duty of Care and Hazardous Waste Regulations not being met (i.e. Waste Transfer Notes and Consignment Notes not being completed). Despite this, most of requirements under the requirements for 'Approval of authorised treatment facilities and exporters' were met except for the 'reporting' and 'record keeping' requirements.

AATFs are required to provide quarterly reports to the EA showing:

- The amount of WEEE (in tonnes) received for treatment.
- The amount of WEEE (in tonnes) treated at an AATF site.
- Amount of WEEE (in tonnes) sent to a different ATF for treatment (including the name and address of the operator of that ATF and of the treatment site if different).
- The amount of WEEE (in tonnes) delivered to a reprocessor for recovery or recycling (including the name and address of the reprocessor and the address of the site where the recovery or recycling was carried out).
- The amount of WEEE sent for re-use of whole appliances (in tonnes).

- The amount of WEEE (in tonnes) delivered to an approved exporter for treatment and recovery or recycling outside the UK (including the name and address of the exporter) (BIS, 2007).

The operator of an AATF (or the approved exporter) is also required to provide the EA with a report from an independent auditor confirming that the evidence notes issued by the AATF or approved exporter are consistent with the amount of WEEE received or exported for treatment, recovery or recycling or re-used as a whole appliance in the relevant approval period. The 3 SMEs audited were not able to provide this independent audit report.

All 44 businesses were responsible for disposing of historic WEEE (end-user). Only 6 out of 20 (30%) waste SMEs were able to provide evidence of safe disposal, which is surprising considering that they would be expected to be aware of the legislation because they work in the waste industry on a daily basis; the 6 compliant SMEs were those operating as AATFs or under a paragraph 41 exemption. None of the remaining 24 SMEs were able to provide any evidence. Some SMEs claimed that they hadn't had to dispose of any WEEE; however, in some occasions there was evidence of WEEE being disposed of within the general waste and/ or being stock-piled or disposed of via Household Waste Recycling Centres (HWRC). Although some HWRCs do receive trade waste, the majority do not; when questioned, the SMEs explained that they masqueraded as householders rather than enquiring whether trade waste was received. In general, knowledge of the final user requirements was poor (only those sites operating as AATFs were able to provide any evidence). SMEs were not aware that they could have 'historic' WEEE disposed of free of charge if replaced on a like-for-life basis, with all 'new' WEEE being the responsibility of the producer.

Business end-users are responsible for arranging and financing WEEE collection and treatment themselves in accordance with the WEEE Regulations if historic WEEE (WEEE from products placed on the market before 13th August 2005) is not being replaced by new EEE serving an equivalent function (BIS, 2007).

All other non-household WEEE should be the responsibility of a producer compliance scheme that can be called on to collect and treat the WEEE unless the producer has made alternative arrangements with the end-user. Producers or PCSs who make alternative agreements with end-users for dealing with WEEE under the WEEE Regulations should keep records of this in order to demonstrate how they are complying.

Overall, SME knowledge and awareness of the regulations was extremely poor, with only one of the non-waste SMEs aware of the regulations. Moreover, only those waste SMEs operating as AATFs or under an exemption were aware of any of the requirements in the regulations.

Although it was not possible to speak to an officer or Government official directly involved in the implementation/ enforcement of these regulations, there appeared to be some real confusion about the requirements particularly because of the range of obligations placed on different businesses depending on their position in the supply chain. Of the EA officers interviewed, they accepted that the regulations were complex and that businesses would be allowed some time before the EA's enforcement policy would be applied. This confusion was exacerbated because the regulations were relatively new and it was accepted that there was a "*light touch*" in terms of enforcement; this was reflected in the lack of any prosecutions at the time of writing.

Compliance with The RoHS Regulations

Only 1 business was classified as a producer and thus was directly required to comply with the regulations. However, 7 additional SMEs were indirectly obligated under the regulations in that they provided materials to EEE producers; these businesses were assessed in terms of the 'spirit of the law'.

Table 4.16 shows compliance against the different requirements and Table 4.17 shows the number of potential offences identified.

The regulations ban the putting on the EU market of new EEE containing more than the permitted levels of lead, cadmium, mercury, hexavalent chromium and both polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE) flame retardants. The regulations primarily apply to manufacturers; however, they also impact those who import EEE into the EU on a professional basis, those who export to other Member States and those who rebrand other manufacturers' EEE as their own. Producers must be able to demonstrate compliance by submitting technical documentation to the enforcement authority on request and retain such documentation for a period of 4 years after the EEE is placed on the market (NMO, 2009).

The results show that 'letter of the law' compliance for the 1 obligated SME was met. However, even though 100% compliance was awarded, regulation 7 was the only requirement that the SME could be assessed against and thus the results were limited. Moreover, the SME was unable to categorically prove its compliance as specific technical documentation or testing had not been conducted. Although, the regulations specify the requirement for technical documentation to be prepared, retained and submitted, there is no explicit requirement for this to be produced automatically, although it is considered best practice (BERR, 2007).

'Spirit of the law' compliance was good; the obligated SME showed very good product and technical knowledge of the legislation and how it needed to comply (the removal of leaded solder was the main requirement), although it could not be regarded as following best practice.

The other 7 indirectly obligated SMEs were assessed purely against the spirit of the law. The audits showed that only 2 of the 7 (28.6%) SMEs were aware of the regulations and had considered how they might meet them. The 2 compliant SMEs produced Safety Data Sheets (SDS) which explicitly stated that the materials they provided did not exceed the banned substance limits. Further investigation identified that this was due to supply chain pressure, whereby, those businesses purchasing materials to be used in EEE asked for confirmation that they conformed to the regulations. The remaining 5 SMEs had not considered the regulations and were not aware they existed.

Although there was no direct offences against any of the 4 main requirements in the regulations, 5 potential offences were identified under regulation 22 ('liability of persons other than the principal offender'), due to the potential for those SMEs supplying material to EEE producers not complying with the regulations.

At the time of writing, there was no evidence of any direct prosecutions under the regulations, however, evidence from the NMO's 2008/9 end of year report confirmed that for the period 1st April 2008 – 31st March 2009 there had been a range of activity by the regulator (NMO, 2009). It reported that it had directly investigated over 250 individual companies, resulting in the

establishing of 12 improvement plans, 3 EU notifications, 4 product withdrawals, 5 compliance notices and 3 warning letters.

A representative from the NMO was interviewed, who felt that the main issue is “*SME penetration*” - making businesses aware. Those who have been made aware, generally found the information useful, particularly as the regulations are relatively short and clear to follow. The interviewee acknowledged that although there had been no formal enforcement action, they had written to businesses under regulation 8, issued warnings and taking equipment off the market (£25m worth of product withdrawals) under regulation 7.

The NMO acknowledged that compliance is difficult for those businesses where it is a small part of their business (i.e. they may import one or two electrical product lines) but they are still regarded as an EEE producer. The interviewee also explained that large SMEs comply better than small SMEs.

Overall, knowledge from the obligated SME was good as it had had to alter the contents of its components so that leaded solder was not present. However, only 2 of the indirectly affected SMEs had any knowledge of the regulations.

Discussion

The key discussion points from this research have been grouped into a number of categories, including: compliance levels, the impact and effectiveness of environmental legislation and environmental compliance control systems.

Compliance levels

This research has shown that compliance levels (‘letter of the law’) with the producer responsibility legislation audited were poor (Tables 4.10 and 4.14). Unless forced to, the SMEs made little effort to interpret the law, seek out compliance or follow best practice (‘spirit of the law’). Compliance was deemed to be good for some of the technical aspects of the RoHS and PER Regulations (Tables 4.12 and 4.16), even though in some cases SMEs were unconsciously compliant. It was felt that this was due to more pressure from the supply chain as well as there being perhaps more ‘technically appreciative’ individuals working in these sectors.

The interviews with SMEs suggested that knowledge, awareness and understanding of the legislation audited was also poor. Although in some cases the sample size was low, these results are supported in a general sense by a number of other studies, including: Bland *et al.*, 2004, Fairman and Yapp, 2005, Wilson *et al.*, 2007, Taylor/ YouGov, 2007, Atkins, 2007 and Wilson and Williams, 2008. The research suggested that SMEs tend to base compliance-related operational decisions on what others were doing as well as applying what they thought was common sense (although crucially without the pre-requisite knowledge).

The reasons for the low levels of compliance and understanding, included, the fact that there is a significant amount of environmental legislation for SMEs to comply with; there is up to 80,000 pages of European legislation (Williamson *et al.*, 2006), over 500 EU Directives covering the environment (Ebbage, 2009) and since 1997, more environmental legislation has gone through the UK parliament than any other area of law except that covering justice and tax (Ends, 2008).

The legislation audited was considered complex and ever changing. Where exemptions existed, these often require businesses to make a lot of effort to identify them (thus negating the perceived benefit of the exemption); the PRO and WEEE Regulations in particular were cited as being extremely complex. Relatively speaking, there was little pressure to comply and thus a perception that the legislation isn't important and/ or that compliance is pedantic and in the main unnecessary; this is despite the EA and NMO in particular targeting compliance with the PRO and RoHS Regulations.

Most SMEs seemed to be clear what the term 'compliance' meant - "*meeting the letter of the law*", however, this was viewed literally with little effort made to interpret the requirements. Although SMEs saw managing their environmental impact as being part of their site management/ health and safety role, in practice, few managers actually conducted specific environmental checks to support this. SMEs considered compliance to be what the regulator identified rather than that included in legislation. Due to little attention often being paid by the regulator, this resulted in many SMEs believing that they were compliant and/ or not committing any offences. This perception is supported by Petts (2000) who described SMEs as "*vulnerably compliant*".

Impact and effectiveness of environmental legislation

Due to many SMEs not being aware of environmental requirements, it is difficult to surmise if this is because there is too much to comprehend or whether SMEs are just not making the effort to comply; if the latter is true, then it is reasonable to assume that in many cases the impact of environmental legislation is negligible.

Despite this, there is a significant accumulation factor for those SMEs that make the effort to interpret and comply. As a consequence, it is crucial that this is considered when postulating new regulations. In a general sense, from the discussions held with Government officials, there appeared to be little understanding of other related legislation as well as the overall statute book and thus, what was considered reasonable was not considered in light of existing legislation.

Of the regulations audited, Gardner and Hills (2007) suggested that the PRO Regulations have been successful in terms of increasing the amount of packaging material recycled (although other issues have been a factor). However, they also highlighted that the regulations have not been as successful at minimising overall packaging or improving the design of packaging, nor have they encouraged firms to improve the recyclability of packaging or to use environmental friendly packaging. Moreover, the authors reported that larger firms were generally more responsive to the regulations.

In addition, a DTI (2003) report suggested that it is difficult to distinguish between the impact of the PER Regulations and changes that would have resulted anyway through commercial pressures, i.e. light weighting of packaging is not new. They reported that enforcement of the Essential Requirements has encouraged discussions between the enforcement authorities and companies producing or distributing packaged goods and the regulations have enabled a number of companies to improve packaging optimisation etc...

Surveillance of SMEs and enforcement activity as a result of non-compliances was generally low. Notwithstanding the EA's and NMO's proactive enforcement surveillance, in general SMEs are given the responsibility to organise their own compliance. Moreover, much of the surveillance is sporadic and backed up with limited resource.

Gardner and Hills (2007) reported mixed opinions as to whether the PRO Regulations had been effectively enforced although they were considered to be more effective than the PER Regulations. The authors state that the EA has a rolling sample system rather than following up every case. The authors stated that if the *de minimis* was not in place the regulations would have been “*completely unenforceable*”. The authors also reported examples of where the regulations were not taken seriously, particularly smaller firms.

Similarly, the DTI (2003) stated that the PER Regulations are largely self-policing with generally large companies putting pressure on their suppliers to ensure that they comply. The only supply chains left completely outside this loop are those where no big company is involved. The report concludes that that system is still developing, but that for it to work, an enforcement regime has to be in place. The UK enforcement authorities may be understaffed, but their involvement is crucial in triggering introduction of the self-policing system described in this report. Although the report highlights that there is now a reasonably high level of awareness in the UK, it focused on larger firms. Moreover, the report explained that enforcement activity has slackened off as many TSO claim to be satisfied with companies’ response to the regulations.

At the time the research was conducted, there had not been any prosecutions under the WEEE or RoHS Regulations and enforcement under the PER Regulations was extremely low (6 prosecutions since 1998). This is supported by Letsrecycle.com, 2007 and LACORS, 2009, with Bland *et al*, 2004, Benson *et al*, 2006, Wilson and Williams, 2008 and Warren, 2006 making similar conclusions from other areas of environmental law. Where there were regulatory inspections, these results also suggest that the regulatory requirements were not being fully identified by regulators. The interviews suggested that many of the regulatory investigations were prompted by complaints rather than through the routine inspections. Hutter (1986) explained that complaints aren’t necessarily the most reliable source of information as they are not necessarily prompted by the most serious offences; this is compounded by the fact that relying on the public to report offences is problematic as they do not possess the requisite knowledge to identify offences.

These results suggest that the regulatory authorities are either failing to implement their enforcement policies or they are failing to identify non-compliances due to the infrequency or limited nature of their inspections. These results also suggest that the regulators may not consider compliance with certain regulations to be essential to ensure environmental protection and thus there was no need to prosecute.

The consequence of the low levels of compliance is a potential for environmental harm, although the extent of the link was unclear. Due to the producer responsibility nature of the legislation, there was little by way of direct pollution, however, that does not negate the potential for indirect pollution caused by firms failing to for example finance the collection and recovery of packaging. As a consequence, it was extremely difficult to identify a direct link between compliance and environmental protection; demonstrating the importance of conceiving legislation where this direct link is synonymous with compliance.

Environmental compliance control systems

How companies respond to impending regulations is an important aspect of corporate strategy. Clement *et al.*, (2008) examined the relationship between size and choice of response as viewed by regulators and reported that larger firms favoured more passive strategies because of

the resources that can be put into complying. Moreover, Baylis *et al.*, (1998) explained that SMEs are motivated to a lesser extent by regulation than larger companies even though compliance with regulation is the most common source of environmental motivations for all sizes of company. Baylis *et al.*, (1998) and Petts *et al.*, (1999) suggest that environmental performance can be improved through the extension of regulation. Because SMEs may not take regulation as seriously, the level of environmental risk in SMEs is perhaps higher than the level of risk attributed by environmental regulators. The high risks were due to poor operational management rather than high 'hazards' associated with the SMEs' activities.

Hopkins (1994) suggests that we need to think carefully about what we ask SMEs to comply with. He explained that specific requirements can be easier to comply with than outcome focused legislation; however, where regulations are specific they need to be clear and practical to implement. The interviews with management and site staff identified that SMEs have problems applying the "*reasonably practicable*" mantra associated with this type of legislation; this can make the legislation un-auditable from an SME's perspective.

Conversely, SMEs were not against more face-to-face contact from regulators. This is supported by Williamson *et al.*, (2006) who reported that the most important need was for clear information on regulations, closely followed by direct guidance and individual support (i.e. handholding). The need for direct support for SMEs is supported by Fairman and Yapp (2005) and Alexopoulou (2007), the latter of which stated that despite their resource intensiveness, regulatory inspections are the most effective and reliable compliance assessment method that can achieve an acceptable level of compliance with efficient use of regulator resources! This research was not supported by Sniffer (2009) who was not able to predict the effect on levels of compliance of increasing or decreasing the rate of inspection. The Sniffer research appeared to have a number of flaws both in terms of methodology as well as a lack of appreciation for other research conducted.

The different regulatory systems, business type and management level are too complicated for compliance and inspection frequency to be measured on their own. Although, it can never be absolute that more inspections will mean better compliance, it is believed that there is a level where compliance can be maximised.

Conclusions and Recommendations

This study successfully investigated the legal performance of UK SMEs with producer responsibility legislation using a novel, sophisticated and holistic compliance auditing approach. The following conclusions can be drawn from the research:

- 'Letter of the law' compliance was generally poor (Tables 4.10 and 4.14) except for the technical aspects of the RoHS and PER Regulations (Tables 4.12 and 4.16).
- Knowledge, awareness and understanding of the environmental legislation audited was poor; this improved commensurate with effort.
- SMEs considered compliance to be what the regulator identified rather than that included in legislation; this was viewed as an inevitable consequence of the complicated nature of some environmental legislation.
- Enforcement activity and surveillance of SME compliance was generally low; there has not been any formal enforcement action taken under the WEEE or RoHS Regulations and enforcement under the PER Regulations is extremely low.

- Regulatory requirements were not being identified by the enforcement authorities and thus where businesses are not forthcoming with compliance failures and/ or where this is not identified in outcome-based actions, it is likely that many more businesses are failing to comply with environmental legislation.
- The consequence of low compliance levels is a potential for environmental harm. Although, it was unclear as to the extent of this damage, a large number of potential offences were identified (Tables 4.11, 4.13, 4.15 and 4.17).
- Although most SMEs felt the regulations were burdensome, they did not seem to have a significant impact on the sites' audited as they did not initiate any significant changes to behaviour or operations.
- There can be a significant 'accumulation factor' in terms of the impact of environmental legislation on SMEs. This needs to be carefully considered when making decisions on future regulatory policy.
- There is a level of regulatory inspection where compliance can be maximised.

There is a clear need for further study in the field of environmental compliance in SMEs.

Specific recommendations include:

- A more sophisticated SME screening process is required in order to help identify those organisations which can pose a risk to the environment and in particular for those SMEs not currently part of an inspection regime.
- Risk assessments need to use compliance auditing as part of this screening process, offering a link between compliance and environmental protection.
- SMEs need to improve their compliance control systems. They need guidance and support in order to measure their compliance; this may best manifest itself in the development of environmental compliance performance indicators (CPIs).
- More research is needed into the impacts and effectiveness of environmental legislation by investigating the link between environmental compliance and environmental protection.
- Regulatory inspection frequency needs to be reviewed so that maximum effectiveness can be achieved – more research is needed to identify the most efficient level of inspection frequency, so the point in which inspections no longer become effective (and actually become negative) can be identified.

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Tables

Table 4.10 Compliance with The Producer Responsibility Obligations (Packaging Waste) Regulations

Compliance by SME sector	A	B	TOTAL
No. of sites bound by the regulations	2	2	4
No. of additional sites handling <50 tonnes packaging	-	2	2
No. of additional sites with <£2m turnover	1	3	4
No. of 'small producers' (<£5m turnover)	2	-	2
Legislative Requirements			
Part II Producers and obligations (actual/ potential) % are unbracketed			
Producers and producer responsibility obligations	(0/2) 0	(0/2) 0	0
Producers' must register with the appropriate agency when not a member of a scheme			
Producer's must recover and recycle packaging waste as calculated in Sch. 2	(0/2) 0	(0/2) 0	0
Producer's must provide a certificate of compliance to evidence its recovery and recycling obligations (Reg 21)	(0/2) 0	(0/2) 0	0
If the producer's main activity is as a seller, to provide information concerning the return and recycling of packaging to consumers of its product	-	-	-
Part III Registration: Producers and Schemes (actual/ potential) % are unbracketed			
Producer registration obligation	(0/2) 0	(0/2) 0	0
Producers are required to register with the appropriate agency in a year or any part of it during which they are not scheme members			
Application for producer registration	(0/2) 0	(0/2) 0	0
Unregistered producers are required to apply for registration to the appropriate agency before 7 th April in that year.			
Conditions of registration of a producer	(0/2) 0	(0/2) 0	0
Producer registration is subject to the producer: -			
(a) complying with regulation 4(4)			
(b) providing information requested by the Agency under regulation 4(4)	-	-	-
(c) informing the Agency of changes in circumstances within 28 days	-	-	-
(d) providing records and returns under regulation 20	(0/2) 0	(0/2) 0	0
(e) Notifying the Agency if cancelling registration (i.e. becoming member of a scheme) or ceasing to be a producer	-	-	-
(f) complying with its operational plan under regulation 7(4)	(0/2) 0	(0/2) 0	0
(g) providing a revised operational plan before 31 st January in each year	(0/2) 0	(0/2) 0	0
Information provided to scheme operators	(0/2)	(0/2)	0

Compliance by SME sector	A	B	TOTAL
Producers shall (a) supply scheme operators with information on a form supplied by the Agency (when the operator is registering their scheme)	0	0	
(b) sign the form	(0/2) 0	(0/2) 0	0
(c) ensure that the information is accurate	(0/2) 0	(0/2) 0	0
Part IV Records, Returns and Certificate (actual/ potential) % are unbracketed			
Producers – records and returns	(0/2) 0	(0/2) 0	0
Producers must (a) maintain records for at least 4 years and (b) when he provides a certificate of compliance to the Agency, also make a return of the information (3) The information required from other producers include (a) the tonnage (to nearest tonne) of packaging delivery for recovery/ recycling to a reprocessor or exporter as set out in the PRNs or PERNs acquired and (b) the total tonnes of each material part of the producer's obligation (4) records under 1(a) shall be made available on demand to the Agency			
Producers – certifying obligation	(0/2) 0	(0/2) 0	0
Producers not registered with a scheme and in respect of groups of companies and mid-year changes to provide the appropriate agency with a certificate of compliance on or before 31 January in the year following the year concerned. Schedule 4 what must be contained in a certificate			
Part VIII Groups of Companies, Pub Operating Businesses and Licensors and Mid-Year Changes (actual/ potential) % are unbracketed			
Packaging handled by groups of companies	-	-	-
Packaging handled by licensors and pub operating businesses	-	-	-
Mid-year changes	-	-	-
TOTAL COMPLIANCE BY SECTOR (%)	0	0	
TOTAL COMPLIANCE WITH REGULATIONS (%)	0		

KEY: Industry Type

Sector A: Printing

Sector B: Manufacturing

Table 4.11 Potential offences under The Producer Responsibility Obligations (Packaging Waste) Regulations

Offence No.	Description	
Part IX: Offences; Regulation 40 (Offences and penalties)		
Regulation 40(1) relating to Regulation 4(4)a (subject to paragraph 2)	Producers and producer responsibility obligations Producers with producer responsibility obligations must be registered as provided in regulation 6 (i.e. when not part of a scheme) (2) a producer is not guilty of an offence in respect to during any period which under regulation 7(7), he is treated as having been registered.	4
Regulation	Producers must be registered	4

Offence No.	Description	
40(1) relating to Regulation 4(4)b	Where he is: (i) a producer, recover and recycle packaging waste as calculated under Schedule 2; or (ii) a small producer who has elected to follow the allocation method, recycle packaging waste as calculated under paragraphs 2, 7 and 8 of Schedule 2	
Regulation 40(1) relating to Regulation 4(4)c	Certificates of compliance Furnish a certificate of compliance in respect of his recovery and recycling obligations in accordance with regulation 21	4
Regulation 40(3) relating to regulation 12(1)	Schemes general provisions An operator of a scheme who fails to comply with his recovery and recycling obligations in contravention of regulation 12(1) [i.e. acquiring of PRNs] is guilty of an offence.	4

NB. Only applicable offences listed above

Table 4.12 Compliance with The Packaging (Essential Requirements) Regulations

Compliance by SME sector Legislative Requirement	A	B	TOTAL
No. of sites bound by the regulations	3	8	11
General Requirements (actual/ potential) % are unbracketed			
General duty relating to the placing of packaging on the market Meeting the essential requirements: - - Requirements specific to the manufacturing and composition of packaging - Requirements specific to reusable packaging - Requirements specific to the recoverable nature of packaging	3/3 100	6/8 75	9/11 81.8
Concentration levels of regulated metals present in packaging Concentration levels of regulated metals (not to exceed 100 ppm)	3/3 100	8/8 100	11/11 100
Request for technical documentation Submission of technical documentation	-	-	-
TOTAL COMPLIANCE BY SECTOR (%)	100	87.5	
TOTAL COMPLIANCE WITH REGULATIONS (%)	90.9		

KEY: Industry Type

Sector A: Printing

Sector B: Manufacturing

Table 4.13 Potential offences under The Packaging (Essential Requirements) Regulations

Offence No.	Description	
Part IV: Offences; Regulation 9 Offences		
(a) Any person who contravenes or fails to comply with regulation 5 shall be guilty of an offence		2
(b) Any person who fails to supply or retain technical documentation or other information as required by regulation 7(1) and (2) shall be guilty of an offence		-
Other offences referred to in the Regulations: • Contravening a suspension notice		-

Offence No.	Description
	<ul style="list-style-type: none"> Intentionally obstructing the enforcement authorities Knowingly or recklessly making a false statement of compliance

Table 4.14 Compliance with The Waste Electrical and Electronic Equipment Regulations

Compliance by SME sector Legislative Requirement	A	B	C	D	E	TOTAL
No. of sites bound by the regulations	3	11	5	20	5	44
Compliance with the Regulations						
Part 3 Producer Obligations (%) (actual/ potential) % are unbracketed						
Financing: WEEE from private householders Producer responsibility	-	-	-	-	-	-
Producer re-registration after withdrawal of scheme approval	-	-	-	-	-	-
Financing: WEEE from users other than private householders New WEEE disposed and historic WEEE being replaced on a like for like basis	-	1/1	-	-	-	100
Obligation to join a scheme	-	1/1	-	-	-	100
Information provided to operators of schemes	-	1/1	-	-	-	100
Declaration of compliance	-	-	-	-	-	-
Record keeping	-	1/1	-	-	-	100
Declaration of EEE producer registration number	-	1/1	-	-	-	100
Marking EEE with the crossed out wheeled bin symbol	-	0/1	-	-	-	0
Marking EEE with a producer identification mark and a date mark	-	0/1	-	-	-	0
Information on new types of EEE	-	0/1	-	-	-	0
Part 4 Scheme Obligations						
N/A	-	-	-	-	-	-
Part 5 Distributor Obligations and Rights: WEEE from Private Households						
Take back	-	0/1	-	-	-	0
Returns	-	-	-	-	-	-
Information	-	0/1	-	-	-	0
Record Keeping	-	0/1	-	-	-	0
Part 6 Miscellaneous						
Final user financing obligation WEEE from users other than private households	0/3	0/11	0/5	6/20	0/5	6/44 13.6
Obligation to optimise reuse and recycling of WEEE	-	-	-	-	-	-
Prohibition on showing the costs of financing the collection, treatment and environmentally sound disposal of WEEE from private households	-	-	-	-	-	-
Part 7 Approval of proposed schemes and withdrawal of approval of schemes						
N/A	-	-	-	-	-	-
Part 8 Approval of authorised treatment facilities and exporters						
Requirement for approval	-	-	-	3/3	-	100
Application for approval	-	-	-	3/3	-	100
Application for extension of approval of an exporter to an additional site	-	-	-	-	-	-
Conditions of approval (part 2, schedule 8)	-	-	-	3/3	-	100

Compliance by SME sector Legislative Requirement	A	B	C	D	E	TOTAL
Reporting	-	-	-	0/3	-	0
Record keeping	-	-	-	0/3	-	0
TOTAL COMPLIANCE BY SECTOR (%)	0	26.3	0	42.9	0	
TOTAL COMPLIANCE WITH REGULATIONS (%)	28.6					

KEY: Industry Type

Sector A: Printing

Sector B: Manufacturing

Sector C: Hotel/ Catering

Sector D: Waste

Sector E: Construction

Table 4.15 Potential offences under The Waste Electrical and Electronic Equipment Regulations

Offence No.	Description	Relevant (√)
Part 14 Offences and Penalties		
Regulation 73(1)	A producer shall be guilty of an offence if he a) contravenes or fails to comply with any requirements of regulation: 8 (Financing: WEEE from private households) 9 (Financing: WEEE from users other than private households) 10 (Obligation to join a scheme) 11 (Information provided to operators of schemes) 12 (Declaration of compliance); or 13 (Record keeping) b) furnishes information under regulation 11 and either knows the information to be false or misleading or furnishes such information recklessly and it is false or misleading c) furnishes a declaration of compliance under regulation 12 and either knows the information in the declaration to be false or misleading	-
Regulation 73(2)	A producer shall be guilty of an offence if he contravenes or fails to comply with any requirements of regulation: 14 (Declaration of EEE producer registration number) 15 (Marking EEE with the crossed out wheeled bin symbol) 16 (Marking EEE with a producer ID and date mark) 17 (Information on new types of EEE) 18 (Producers supplying EEE by means of distance communication) 40(3) (Prohibition on showing the costs of financing the collection, treatment and environmentally sound disposal of WEEE from private households)	1
Regulation 73(3)	An operator of a scheme shall be guilty of an offence if he (a) contravenes or fails to comply with any requirement of regulation: 20 (Application to register producers) 21 (Notification of new scheme members) 22 (Financing: WEEE from private households) 23 (Financing: WEEE from users other than private households) 25 (Treatment) 26 (Recovery)	-

Offence No.	Description	Relevant (√)
	27 (Reporting: WEEE) 28 (Reporting: EEE put on the market) 29 (Declaration of compliance) 30 (Record keeping) 43 (Conditions of approval) (b) furnishes a report under regulation 27 (Reporting: WEEE) or 28 (Reporting: EEE put on the market) and knows the information to be false or misleading (c) furnishes a declaration of compliance under regulation 29 (Declaration of compliance) and knows the information to be false or misleading	
Regulation 73(4)	An operator of a scheme shall be guilty of an offence if he contravenes or fails to comply with any requirement of regulation 24 (Prioritise the reuse of whole appliances).	-
Regulation 73(5)	An distributor of a scheme shall be guilty of an offence if he contravenes or fails to comply with any requirement of regulation 31 (Take back)	1
Regulation 73(6)	An distributor of a scheme shall be guilty of an offence if he contravenes or fails to comply with any requirement of regulation 33 (information) or 34 (Record keeping).	1
Regulation 73(7)	An operator of an AATF or an approved exporter is guilty of an offence if he (a) contravenes or fails to comply with any requirement of regulation: 49 (Conditions of approval) 52 (Reporting); or 53 (Record keeping); or (b) furnishes a report under regulation 52 and he knows the information to be false or misleading	3
Regulation 73(8)	A person shall be guilty of an offence if he (a) contravenes or fails to comply with any requirements of regulation: 36 (Final user financing obligation: WEEE from users other than private households) 40(1) (Prohibition on showing the costs of financing the collection, treatment and environmentally sound disposal of WEEE from private households); or 46 (Requirement for approval) (b) without reasonable excuse, fails to comply with an enforcement notice under regulation 71 (enforcement notice). (c) without reasonable excuse, fails to comply with a requirement imposed under regulation 72 (entry and inspection) (d) intentionally obstructs any person acting in the execution of these Regulations (e) without reasonable excuse, fails to give to any person in the execution of these Regulations any assistance or information which that person may reasonably require (f) without reasonable excuse, fails to produce information when required to do so to any person acting in the execution of this powers (g) furnishes information to any person acting in the execution of these regulations any information which he knows the	38

Offence No.	Description	Relevant (√)
	information is false or misleading	
Regulation 73(9)	A person shall be guilty of an offence if he contravenes or fails to comply with any requirement of regulation 37 (Obligation to optimise reuse and recycling of WEEE)	-

Table 4.16 Compliance with The Restriction of use of certain Hazardous Substances in Electrical and Electronic Equipment Regulations

Compliance by SME sector Legislative Requirement	A	B	TOTAL
No. of sites bound by the regulations (actual no.)	-	1	1
No. of additional sites involved in the EEE sector	-	7	7
PART 2 PRODUCERS OBLIGATIONS (%)			
Prohibition on hazardous substances (reg. 7)			
New EEE put on the market must not contain lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls or polybrominated diphenyl ethers in quantities exceeding 0.1% by weight (except for cadmium which is 0.01% by weight).	-	1 (1) 100	100
Technical documentation (reg. 8)			
Producers shall:	-	-	-
(a) prepare technical documentation or other information showing that any EEE which they have put on the market complies with regulation 7;	-	-	-
(b) retain that technical documentation or other information for a period of 4 years from the date on which they put the equipment on the market; and	-	-	-
(c) if the SoS requests, submit that technical documentation or other information to him within 28 days of the date of the notice.	-	-	-
TOTAL COMPLIANCE BY SECTOR (%)	-	100	
TOTAL COMPLIANCE WITH REGULATIONS (%)		100	

KEY: Industry Type
Sector A: Printing

Sector B: Manufacturing

Table 4.17 Potential offences under The Restriction of use of certain Hazardous Substances in Electrical and Electronic Equipment Regulations

Offence No.	Description	Relevant (√)
Regulation 16	<p>Offences</p> <p>A person who contravenes or fails to comply with any requirement of:</p> <ul style="list-style-type: none"> Regulation 7 (Prohibition on hazardous substances), Regulation 8 (Requirement for technical documentation), or An enforcement notice shall be guilty of an offence <p>Compliance and enforcement notices may be served on the</p>	-

Offence No.	Description	Relevant (√)
	producer under regulations 14 and 15.	
Regulation 22	<p>Liability of persons other than the principal offender Where the offence is due to the act or default by some other person in the course of any business of his, the other person shall be guilty of the offence and may be proceeded against and punished (whether or not any proceedings are taken against any other person).</p>	(5)
Defence (regulation 21)	<p>In proceedings against any person for an offence (reg. 16), it shall be a defence for that person to show that he took all reasonable steps and exercised all due diligence to avoid committing the offence.</p> <p>Where the offence was alleged to have been caused by the act or default of another or was due to the reliance on information given by another, the person shall not be able to rely on the defence unless not later than 7 clear days before hearing of the proceedings he has served a notice on the person bringing the proceedings.</p> <p>A person will not be able to rely on the defence provided above by reason of his reliance on information supplied by another, unless he shows that it was reasonable in all the circumstances for him to have relied on the information.</p>	

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4.2.7 Wilson, C, D, H; Williams, I, D and Kemp, S (2011)

Compliance with Environmental Command and Control Legislation: Experiences from UK Small and Medium-Sized Enterprises. Communications in Waste and Resource Management.

This paper presents results from compliance audits of command and control style legislation. The papers incorporated legislation controlling non-hazardous and hazardous waste, waste transfer, site waste management plans and waste exemptions.

This paper refers to the research conducted as part of the author's final PhD submission and forms part of the discussion and conclusions in Chapters 5 and 6.

See below for a full copy of the paper.

Compliance with Environmental Command and Control Legislation: Experiences from UK Small and Medium-Sized Enterprises

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Abstract

This study investigated the compliance of UK SMEs with a sample of environmental command and control legislation. The study incorporated legislation controlling non-hazardous and hazardous waste, waste transfer, site waste management plans and waste exemptions. Compliance audits and interviews were conducted with SMEs, regulators, Government policy officials and SME support organisations. Forty-four SMEs from the north-west of England were audited between April-September 2008. The findings of the study indicate: -

- Low levels of compliance with the 'letter' and 'spirit' of the law.
- Enforcement activity and surveillance of the SMEs audited was very low; nationally, there has not been any formal enforcement action taken under The SWMP Regulations and enforcement under other regulations is extremely low.
- SMEs considered compliance to be what the regulator identified rather than that in legislation. Regulator enforcement policies were inconsistently followed; deviation from enforcement policy was acceptable if this encouraged compliance.
- There was evidence of direct and indirect environmental harm as a result of non-compliance.
- Whilst we have kept the 'command' style of environmental legislation there appears to be much less 'control'.

Recommendations on how to improve SME compliance control systems are provided.

Key words: Compliance, legislation, SMEs, environmental law, auditing.

Introduction

There has been a great deal written about the difficulties faced by small and medium-sized enterprises (SMEs) compared to larger companies. SMEs face difficulties complying with environmental legislation, particularly because there is a great deal of complex law to comply with, resulting in issues such as profitability, competitiveness and staffing taking priority over environmental considerations (Fay, 2000). As a result, SMEs have been shown to have low levels of awareness and understanding of environmental issues (Taylor/ YouGov, 2007, Atkins, 2007), with some research showing low levels of compliance with specific legislation (Bland *et al.*, 2004, Fairman and Yapp, 2005, Wilson *et al.*, 2007 and Wilson and Williams, 2008).

Because of the very large number of UK SMEs, they can have a huge collective impact on the environment even though they may be individually small. In fact, the UK Environment Agency (EA) has suggested that up to 80% of environmental incidents are caused by SMEs (this is supported by Hillary, 2000, Williamson *et al.*, 2006 and Fairman and Yapp, 2005). However, anecdotal evidence suggests that regulatory authorities concentrate their efforts on larger organisations that are perceived to have a higher potential to pollute.

The research on compliance with legislation has often been conducted in isolation with little research comparing compliance across a range of legislation, and certainly not using triangulation methods to assess SMEs' overall legal performance. This is because it is often difficult to determine compliance (Wilson and Williams, 2008), with regulator's prosecution and enforcement action not truly reflecting actual compliance (Bland *et al.*, 2004).

SMEs are vital to the UK economy; they account for 99.7% of businesses (totalling 4.7 million), 47.5% of employment and generate 48.7% of turnover (Richard, 2007). They are defined as businesses employing <250 members of staff, having a turnover of <€50 million and/ or an annual balance sheet of <€43 million (European Commission, 2006).

Over the past few years, the UK has been focused towards achieving 'better regulation'. In particular, Hampton (2005) and what was then the Better Regulation Commission highlighted the need for more strategic thinking when it comes to developing regulation. Hampton suggested that regulators should use a risk-based model similar to that used by the EA in England and Wales (IEMA Practitioner, 2005).

This view is shared by other regulators, such as Local Authorities (LA), who have responsibilities for enforcing certain environmental legislation. However, there has been criticism from some commentators who suggest that certain legislation is not successfully enforced (Benson *et al.*, 2006, Letsrecycle.com, 2008). This is supported by other research comparing compliance rates and enforcement data (Bland *et al.*, 2004; Fairman and Yapp, 2005; the OECD, 2004; Wilson *et al.*, 2007 and Wilson and Williams, 2008).

Although better regulation is termed "*modern regulation*" by the EA (2006), the increased use of risk assessment has reduced the number of inspections (although more detailed audits have increased (see Ends, 2010) resulting in more 'pressure' being put on remaining inspections as well as there being less opportunity to identify non-compliance and promote the regulator's role (Bell and McGillivray, 2006 and Ends, 2003). In addition, those businesses not included under the environmental permitting or other direct regulatory regime are unlikely to be audited for compliance against any environmental legislation; consequently a significant portion of **all** businesses go un-inspected and uncontrolled (Gunningham, 2002). Because of the number of SMEs, there needs to be an effective system of regulation that controls activities and targets those businesses that pose a risk to the environment, without unnecessarily over-burdening SMEs.

Purpose of the study

The study builds on and complements findings from previous research conducted by Wilson *et al.*, (2007, 2009 and 2010) and Wilson and Williams (2008). This work is part of a larger piece of research investigating a wide range of SME sectors' compliance with major environmental legislation.

This part of the study focused on UK SME compliance with command and control legislation (see below) across 5 business sectors. The research incorporated 7 major pieces of UK legislation, including: section 34 of the Environmental Protection Act 1990; The Environmental Protection (Duty of Care) Regulations 1991 (as amended); The Hazardous Waste (England and Wales) Regulations 2005; The Site Waste Management Plans Regulations 2008; the Control of Pollution (Amendment) Act 1991; The Controlled Waste (Registration of Carriers and Seizure of Vehicles) Regulations 1991 (as amended) and Schedule 3 of The Environmental Permitting (England and Wales) Regulations 2007.

The overall aim of the study was to determine and evaluate the level of compliance with environmental command and control legislation. The study complements a similar study looking at producer responsibility legislation (Wilson *et al.*, 2010) as well as identifying the impact and

effectiveness of environmental legislation and helping to inform policy on how to improve the environmental compliance control systems for SMEs.

Command and Control legislation

The intended goal of environmental regulation is to protect the environment. UK environmental policy has traditionally followed a 'command and control' reactive approach and based on negotiation between industry and Government.

Command and control legislation focuses on preventing environmental problems by prescribing how businesses have to manage a pollution-generating process (i.e. the 'command') followed by an inspection programme and enforcement if necessary (i.e. the 'control'). However, as environmental policy has embraced the concept of sustainable development (economic and social factors are considered alongside the environment) this has resulted in the use of different policy instruments both in terms of how the law is written and how it is enforced. This has resulted in a mix of new and old approaches to regulation (POST, 2004).

The favoured approach today is for regulation to be 'outcome-based' with businesses given flexibility in how they meet requirements as well as enforcement being more self-regulated. However, this requires regulators to have a detailed understanding of the processes and/ or their alternatives, whilst self-regulation requires a good deal of trust between the regulator and the regulated.

'Self-regulation' provides an alternative enforcement mechanism, but it relies on businesses to continually monitor and evaluate their compliance. Some research indicates that self-regulation and enforced self-regulation are cheaper for both regulators and the regulated compared with enforcement in command and control regimes (Fairman and Yapp, 2005). However, it has been suggested that in companies that are *"too small to afford their own compliance"* (Ayres and Braithwaite, 1992:106), self-regulation may be unsuitable and therefore, traditional command and control regimes may be more appropriate. Despite this, there has been a general move towards self-regulatory approaches within environmental law.

The main advantage of a command and control approach is that it creates certainty by setting out clear boundaries within which businesses can operate. However, it has been criticised for stifling innovation, being inflexible, inefficient, costly, hard to enforce and focuses on 'end-of-pipe' solutions (Ayres and Braithwaite, 1992; Gunningham, 2002; Hutter, 1997 and Fairman and Yapp, 2005b). These problems have led to an increased interest in alternatives.

Despite the move away from the 'control' style enforcement policies there is still evidence of new 'command and control' legislation being introduced, albeit with a more self-regulatory, outcome based enforcement strategy.

The Waste 'Duty of Care'

The 'duty of care' was introduced in part 2, section 34 of the Environmental Protection Act (EPA) 1990 and is supported by The Environmental Protection (Duty of Care) (DoC) Regulations 1991 (as amended).

It is the duty of anyone who imports, produces, carries, keeps, treats or disposes of controlled waste, or as a broker has control of such waste to:

- Prevent any contravention by any person of section 33 (unauthorised or harmful deposit, treatment of waste);
- To prevent any contravention by any other person of regulation 12 of The Environmental Permitting (England and Wales) Regulations, or of a contravention of a condition of an Environmental Permit;
- Prevent the escape of waste from his control or that of any other person; and
- On the transfer of waste to secure:
 - that the transfer is only to an authorised person or to a person for authorised transport purposes; and
 - that there is transferred such a written description of the waste as will enable other persons to avoid a contravention of that section and to comply with the duty under this subsection as respects the escape of waste.

The DoC Regulations stipulate the information that must be contained on a waste transfer note as well as requiring them to be retained for at least 2 years from the date of transfer.

As all commercial operations produce waste, every business is effectively obligated under the duty of care. The regulations require waste to be managed from 'cradle to grave' and thus require those business involved in the waste chain to check the other businesses up and down the chain. Although the legislation is officially enforced by the EA and LA in England and Wales, they don't tend to be directly enforced. Rather, they tend to be self-regulated by businesses themselves; offences caused under the Act and/ or regulations are generally regarded as administrative oversights, other than where linked to pollution incidents.

Hazardous Waste

In England and Wales, hazardous waste is regulated under The Hazardous Waste (England and Wales) Regulations (HWR) 2005. The regulations revoked The Special Waste Regulations 1996 due to the need to implement changes after an EU decision regarding the implementation of the Hazardous Waste Directive 1991.

The regulations stipulate the following basic requirements:

- Hazardous waste must not be mixed with other hazardous or non-hazardous waste; where waste is mixed, there is a duty to separate where technically and economically feasible;
- Hazardous waste producers must notify their premises to the EA (exemptions apply);
- Hazardous waste must be transferred on a consignment note; a range of information must be included and they must be retained for at least 3 years;
- Standard procedures must be completed when transferring hazardous waste;
- Specific paperwork must be completed when more than one carrier is used or when there are multiple collections of hazardous waste; and
- Site records and returns must be completed and retained.

The HWR also extended the definition of hazardous waste so that it included a wider range of wastes (i.e. that weren't classified as 'special' under the old regulations but that are now 'hazardous'). As a consequence, a large percentage of businesses produce hazardous waste and are obligated.

The EA and LA in England and Wales enforce the legislation. Similarly to the DoC, rather than being directly enforced they tend to be self-regulated, with offences generally regarded as administrative.

Waste Carriers

The Control of Pollution (Amendment) Act (COP(A)A) 1989 and The Controlled Waste (Registration of Carriers and Seizure of Vehicles) (CW [RoCSV]) Regulations 1991 (as amended) require those businesses (unless exempt) who carry/ transport controlled waste in the UK as part of their business, or with a view to profit, to register as a waste carrier.

It is not necessary to register as a carrier if:

- The producer carries his own waste (unless construction and demolition);
- Waste is being moved between different places within the same premises;
- Transporting waste from outside the UK to a place within it; and
- Waste is being transported by sea or air outside the UK.

The EA and LA in England and Wales mainly enforce this legislation. Obligated businesses' details are recorded on a publicly available register and although regulators have stop, search and seizure of vehicle powers, this legislation is mainly self-regulated. The penalty for breaking these obligations is a fine of up to £5,000 on summary conviction and/ or seizure and forfeiture of any vehicles involved.

Site Waste Management Plans

The Clean Neighbourhoods and Environment Act 2005 made it a legal requirement to produce a site waste management plan. The Site Waste Management Plans (SWMP) Regulations (2008) implemented the requirements of the Act; the regulations came into force on the 6th April and apply to England only.

The regulations require any person intending to carry out a construction project with an estimated cost, greater than £300,000 (excluding VAT) to prepare a SWMP; there are additional requirements for projects of greater value than £500,000. If such a project is started without a SWMP, the client and the principal contractor are both guilty of an offence.

The regulations stipulate the following basic requirements:

- The contents of a SWMP (including an estimate of waste types, quantities and waste management options);
- The SWMP must be updated (there are more detailed requirements for projects above £500,000);
- The SWMP must be made available; the Principal Contractor must ensure that every contractor knows where it is kept, and must make it available to any contractor carrying out work described in the plan;
- The principal contractor must keep the SWMP for two years after the completion of the project at the Principal Contractor's principal place of business or at the site of the project; and
- 'Additional duties' must be met by both the client and principal contractor.

The regulations state that they “*may*” be enforced by a number of authorities including the EA and LA; in practical terms the LA are generally considered responsible for enforcement. A breach of the regulations is an offence punishable on summary conviction, to a fine not exceeding £50,000, or an unlimited fine on conviction on indictment. As of the time of writing, there had not been any prosecutions under the regulations.

Waste Exemptions (Environmental Permitting)

The Environmental Permitting (England and Wales) Regulations (EPR) 2007 set out a series of exemptions that enable sites to operate a waste operation without requiring a full permit. The exemptions under EPR replace those under The Waste Management Licensing Regulations 1994 (as amended) and although significant changes have been made to the administration of exemptions, the controls managing how sites’ operate did not specifically change. Generally, sites operating under exemptions under the old waste management licensing regime did not see any changes to exemption conditions.

Schedule 3 of the EPR specifies the types of waste operation which are exempt from permitting. There are two types of exemption: those operations that are considered ‘simple’ (i.e. low risk) and those which are ‘complex’ (‘high risk’) (there are also a number of exemptions (non-notifiable) that don’t need to be registered with the EA).

From April 2010, the EPR 2007 were replaced with the EPR 2010 which changed the arrangement and administration of exemptions; some changes were made to specific conditions although these were not considered significant in the context of this research.

Methodology

The study used a previously developed methodology (Wilson *et al.*, 2008) which outlines a sophisticated and holistic approach to compliance auditing. The approach included the development and use of a novel compliance auditing methodology which incorporated the use of **regulation-specific** and **environmental offences’** audit templates in addition to detailed semi-structured interviews with SME management, site staff, regulators, policy writers and SME support organisations. A pre-written prompt sheet guided the interviews, although discussion was allowed to flow; interviews were recorded and transcribed as well as compared with site audits to ensure accuracy. The approach used is supported by Fink (2003), Berg (2004) and Holbrook *et al.*, (2003).

The audit templates were incorporated into the 3 recognised stages of environmental auditing (i.e. pre-audit fact-find, audit [site visit and document reviews] and post-audit activities) as recommended by Moorman and Kirsch (1991) in order to gain a full picture of individual SME compliance.

The environmental offences’ audit templates were designed in addition to the regulation-specific audit templates so that where legislation was outcome focused, offences could be determined in addition to where regulations were not met.

The 44 management and 34 site staff interviews lasted approximately 1hr and 20 minutes respectively. Interviews of up to 1hr were also conducted with the EA, LA, Defra and SME/ LA support organisations such as the Chamber of Commerce, The Local Better Regulation Office

(LBRO) and The Local Authorities Coordinators of Regulatory Services (LACORS). It was felt that the combination of the above triangulation methods helped to ensure the accuracy of the results. In total, 44 SMEs were audited in the north-west of England between April-September 2008; 20 from the waste management industry, 5 hoteliers, 3 printers, 11 manufacturers and 5 construction businesses.

Results

Compliance with section 34 of the Environmental Protection Act and The Environmental Protection (Duty of Care) Regulations

All 44 SMEs were obligated under the regulations. Only those SMEs operating in the waste industry were not the initial waste producer; the 20 waste SMEs operated as both waste carriers and environmental permit holders, therefore, they occupied different positions in the waste chain. Table 4.18 shows compliance against the different requirements and Table 4.19 shows potential offences.

When assessed against the EPA, the results show that 'letter of the law' compliance was poor with an overall compliance of 35.5%. Overall, the waste and hotel sectors scored the highest with 44% and 36% respectively; the printing (26.7%), manufacturing (27.3%) and construction sectors (24%) scored similarly.

In total, 105 deposits of waste were audited; 100 from the waste sector (95%), 2 from the printing and 3 from the construction sector. Although the importance of observing waste transfers was identified by Wilson *et al.*, (2008), because of the often sporadic and infrequent nature of waste removals it was difficult to co-ordinate them into the site audit and thus only the waste industry audits were conducted in this way.

Due to the use and retention of WTN being crucial to meeting section 34, over 200 WTN were audited: 6 from the printers, 42 from manufacturers, 7 from hotels, 100 from waste companies and 47 from the construction sector. Representative samples were taken from each SME (where available), however, in some cases, very few WTN were available (season tickets were in use, and/ or WTNs weren't retained); explaining the wide range of compliance across the 5 sectors.

Section 34 requires organisations' 'to prevent any contravention by any other person of section 33' (unauthorised or harmful deposit, treatment or disposal of waste). This requirement could only be partially assessed due to the scope of the audit not including an assessment of each load from 'cradle to grave'. Overall, the results show compliance at 54.6%; scores were 60%~ for all sectors except the manufacturing (45.5%) and hotel sectors (40%) which was due to mixing of hazardous and non-hazardous waste, incorrect storage of waste, transferring waste to a consignee not authorised to accept that type of waste and in one instance, unofficially transferring waste to another SME to manage. As a consequence, this could result in a breach of sections 33(1)(b) and 33(1)(c) of the EPA.

The results for the requirement 'to prevent any contravention by any other person of regulation 12 of the EP Regulations or of a contravention of a condition in an environmental permit' were similar, with a total compliance of 45.5%. In many cases, a breach of the previous requirement also resulted in a breach of this requirement. However due to the specific and often

administrative nature of breaching a permit condition, there were a few more potential contraventions. An example included transferring a waste type to a carrier that they were not permitted to receive.

In relation 'to preventing the escape of waste', total compliance was 56.8%, with scores ranging from 100% in the hotel sector to 20% in the construction sector. As expected, those industries handling the largest and most diverse range of wastes scored the lowest as there were more opportunities for non-compliances; the construction sector scored 20% which is representative of the often transient nature of the work and lack of infrastructure on on-site projects. The waste sector score was average (55%) which was due to a combination of the range and amount of waste received along with a heightened presence from the EA. Specific non-compliances included: loose waste, dumped waste in hidden parts of sites, leaking bags of waste, as well as unsheeted skips and damaged storage containers which amounted to a 'potential' for waste to escape.

The requirement to ensure that waste 'is transferred to an authorised person or for authorised transport purposes was only met by 20.5% of sampled SMEs. Managers were more aware of the requirement for waste carriers to be registered than they were of the information required on a WTN. Regardless of this, many SMEs failed to "secure" this matter and thus in many cases presumed that carriers were registered. Although subsequent checks showed that they were registered, very little effort was made to secure this (i.e. carrier registration numbers provided on WTNs was not seen as adequate to confirm compliance). SMEs in the waste sector were the most compliant with this requirement, with 45% able to provide copies of registration certificates under the Control of Pollution (Amendment) Act 1989; none of the other SMEs were able to demonstrate compliance.

Section 34 also requires that on transfer there must be a 'written description of the waste'. This requirement was assessed by each SME having to demonstrate that all WTN were provided on transfer (where this could be assessed) and that all the requirements were met in the DoC Regulations. Of the 105 deposits audited, 82.9% had a WTN available, however, none of the SMEs were able to demonstrate that all transfers met this requirement. Of the 202 WTN audited, none were able to demonstrate that they meet all the individual requirements on the DoC Regulations.

Markedly lower compliance was apparent here than for any other requirement of the EPA as the majority of the written descriptions were insufficient and thus would potentially not enable other persons to avoid a contravention of section 33 or with respect to the escape of waste; a result corroborated by Bland *et al.*, (2004) and Wilson and Williams (2008) in their studies of duty of care compliance.

Compliance with the DoC Regulations was slightly better, with compliance across the 5 sectors of 51%. This figure fell to 39.4% if the requirements were measured against only observed waste deposits as opposed to sampled WTN. Results ranged from 36.4% for printers to 69.7% in the hotel sector. Results for the waste and construction sectors were below average, however, they made up the majority of the sample and thus provide a representative sample of the situation. It is important to mention that these results can't tell how many WTN there should have been, just how good the available WTN were.

When an assessment was made of the number of different waste types produced which were managed separately and the number of different types of WTN available, there was only

evidence of WTN for 59.6% of all potential waste transfers (this dropped to 43.8% if waste scores are excluded); this figure does not reflect the potential number of transfers that could be required and thus in reality the value is likely to be much lower. Results ranged from 30.8% for manufacturers to 72% in the waste industry showing that a large percentage of WTN were potentially not being produced; if sites were audited over a longer period of time then a significant amount of transfers may be made without a WTN. It was common for large amounts of scrap metal and other recyclables to be moved without the use of a WTN and thus on appearance, SMEs can seem more compliant than they actually are.

The use and retention of **WTN** is a significant requirement of the DoC Regulations and thus a representative sample was taken where possible; in total, 202 WTN were audited. A significant portion of these came from the waste, manufacturing and construction sectors (accounting for 93.6%) partly because they made up 81.8 % of the total sample population and also because the other business sectors in many circumstances did not produce a wide range of wastes and/or used season tickets which reduced the amount of potential WTN.

Unlike in the HWR, a pre-described WTN form is not provided in the DoC Regulations. As a result, very few WTN contained all the necessary requirements which meant that few had the potential to be fully compliant. The regulations stipulate 10 requirements, 2 requirements were combined for simplicity to give 9 separate requirements. In total, just over half (50.6%) of the WTN requirements were met. The hotel sector scored highest (75%) with the printing sector scoring lowest (39.1%). The waste sector scored second lowest (45.1%) which suggests that the most regulated aren't necessarily the most compliant.

The *first* requirement requires the 'transferor and transferee to complete and sign the WTN'; the WTN must be signed by both parties when the transfer takes place. In total, 76.1% of WTN viewed were completed (albeit partially in some cases) and signed by both parties. Where the results are based on an assessment of deposits audited, this figure drops to 65.5%. These results show that when used, the majority of WTN met this requirement; however, it is clear that an element still went unchecked. These results should be interpreted with caution as only a small sample of deposits were audited (except for the waste sector) and thus it was difficult to determine if WTN were signed at the time of transfer or retrospectively.

Secondly, the waste must be identified according to the European Waste Catalogue (EWC) code. This was less well completed with 52.7% of WTN containing the correct EWC code. No significance can be attributed to any sector because a large percentage of WTN were completed by the waste carrier rather than the producer of the waste; this was a common occurrence across all sectors. Overall, sites were poor at identifying the correct code, with most relying on what the carrier had pre-printed on the WTN – where EWC codes had to be hand written this was not well completed with knowledge of the requirement being particularly poor considering that this has been a requirement since 2002. Non-compliances, included: failure to use EWC codes, incorrect use of codes as well as failing to identify ALL relevant codes.

The *third*, *fourth* and *fifth* requirements necessitate the inclusion of waste 'quantities' and 'container' description (if applicable). Just under half of WTN met this requirement with scores ranging from 100% (hotel) to 14.9% (construction). Those not complying did not give enough detail, i.e. "1 skip" rather than a estimate of volume or weight, there didn't appear to be any clear pattern in the results other than to say that the quality and consistency varied.

The *sixth* requirement – ‘state the time and place of transfer’ was the least met requirement, with only 17.4% of WTN compliant. Generally, the place of transfer was taken to be the transferors’ address, however, very few WTN included the time of collection. Scores were highest in the waste sector (24.4%) and this was generally felt to be because of the use of electronic weighbridge WTN which recorded the time waste was received.

The *seventh* requirement – ‘give the name and address of the transferor and transferee’, was met by 90.8% of WTN which was expected as the transferee’s address is usually pre-printed and the transferor’s address was needed for invoicing purposes.

The *eighth* requirement – ‘state whether the transferor is the producer or importer’ was met by 50% of WTN. Even though this could generally be deduced from the WTN it was not always clearly set out and thus on occasion was marked as non-compliant.

The *ninth* requirement – ‘state if an authorised transport purpose applies’ was not assessed as no relevant transport purposes were identified.

The *tenth* requirement – ‘state which category the transferor and transferee falls and provide any additional information’ was only met by 20.1% of WTN. All assessed WTN (except for waste SMEs) were derived from transfers between producers and waste carriers on the site of production. Therefore, the applicable transferor and transferee category of the sites audited included the identification of the transferee as a waste carrier under section 2 of COP(A)A (1989) as well as the provision of the EA registration number. Of those required, the vast majority of the WTN identified who the carrier was, however, fewer included details of the carrier’s registration number.

Each SME was assessed individually when auditing the stipulation to keep WTN for 2 years from the date of transfer. Results showed that 19 of 44 SMEs (43.2%) met this requirement; the waste sector performed the best (72% compared to 19.2% in the manufacturing sector). When assessing the total number of current WTN available compared to waste types produced, just over half (54.1%) of WTN were being retained for 2 or more years (this figure drops to 31.3% when the waste sector is excluded).

When interviewed, few SMEs demonstrated knowledge of the regulations nor of what they needed to do to comply. Although understanding was general better here than for any other regulation audited (i.e. the requirement to produce and retain WTN), overall, most SMEs relied on the waste contractor to provide and complete WTN.

Despite the modest levels of compliance, none of the SMEs had received any information or formal enforcement action from the EA or local authority, nor had they been visited or inspected in order to determine compliance. This indicates that the regulatory requirements were not being identified by the EA and thus, where businesses are not forthcoming with compliance failures and/ or where this is not identified in outcome-based actions it is likely that many more businesses are failing to comply. This is supported by Petts *et al.*, (1999) (citing Hillary, 1995 and Baylis *et al.*, 1998) who reported that self-policing through the DoC Regulations is seen as weak amongst a significant proportion of industry because of a lack of knowledge and regulatory support.

The interviews conducted with the EA and LA representatives revealed that enforcement was not seen as a priority. Surveillance and enforcement was very much outcome-based and

responsive to complaints. The duty of care was not something that was part of inspections unless there was an obvious problem. LA stated that auditing of these requirements was difficult as there was no way of checking historical events.

The interviewee most involved in duty of care compliance and enforcement explained that although the EA does proactively seek compliance through different enforcement scheme, these were random and few and far between. The EA explained that it generally felt it was up to industry to self-regulate and that its role was to provide guidance and prosecute where serious offences were caused. This suggests that the regulations are not proactively enforced and this is certainly the consensus of many SMEs who don't feel they are at threat of prosecution no matter what they do.

The interviews conducted with policy officers showed that they favoured a combination of prescriptive and outcome based legislation even though general Government policy favoured outcome based. Support organisations explained that in general environmental compliance support was a very small part of their role and wasn't something they regularly advised SMEs on.

Compliance with The Hazardous Waste (England and Wales) Regulations

All 44 SMEs assessed were obligated under the regulations. Table 4.20 shows how the different requirements were met and Table 4.21 shows potential offences.

The results show that 'letter of the law' compliance was poor with an overall compliance of only 22.3% across the 5 sectors. The manufacturing and waste sectors scored the highest with 28.7% and 28.5% respectively; the printing (3.4%), hotel (2%) and construction (6.3%) sectors scored extremely poorly. Some sectors were particularly difficult to assess due to limited availability of documentation and thus in these circumstances, a judgment was made on the levels of compliance depending on visual evidence and managements' knowledge.

A significant part of the regulations relate to the use and retention of consignment notes (CN) and thus a representative sample was taken where possible; in total, 84 CN were audited. A disproportionate number of these came from the manufacturing and waste sectors (accounting for 95.2%) partly because of the number of these SMEs making up the total sample population (75%) and also because the other sectors did not use or failed to retain CN.

Due to the lack of available CN, an assessment was made of the number of different types of CN that should be available versus the number of types that were available (based on different hazardous waste types requiring separate management). Overall, only 31.9% (38 out of 119) of hazardous waste types had any evidence of CN being used; this figure does not reflect the potential number of consignments that could be required and thus in reality is likely to be much lower if SMEs had been assessed over a longer period of time. Both the manufacturing and waste sectors accounted for the highest percentage of what CN types should be available (41.2% of CN types were available for the wastes managed on site).

Overall, 34.1% of SMEs met the requirement to 'prohibit the **mixing of hazardous waste** without a permit'. Mixing was deemed to mean that two wastes were inherently mixed (homogeneous, i.e. solvents mixed with wood would be classified as mixed, whereas an electrical appliance on top of a cardboard skip would not be). The results were fairly consistent across the 5 sectors, with scores ranging from 20% (hotel) to 45.4% (manufacturing); it was not

surprising that the waste sector scored below average due to the amount of waste received and potential risk of waste being mixed. Where waste becomes mixed, there is a further 'duty to separate mixed waste'; of the 29 sites obligated, none (0%) met this requirement. Interestingly, none of the obligated sites were aware of this requirement, with only a small number of waste SMEs being aware, predominantly because of the nature of the wastes handled (i.e. corrosive, flammable chemicals).

Where hazardous waste is produced at, or removed from, any premises other than exempt premises, the premises must be **notified to the EA**. Due to this requirement being assessed prior to the amendment by The Hazardous Waste (England and Wales) (Amendment) Regulations 2009, all 44 business types were judged to be obligated to comply with this requirement as none qualified as an exempt business type. As well as expanding the type of business which can be exempt, the amendment also increased the qualifying limit from 200kgs to 500kgs per annum. If the SMEs were assessed against the new requirement, then only 20 of 44 (45.5%) SMEs would be required to comply. The results suggested that there was a great deal of misunderstanding concerning the 200kg producer registration exemption for sites who were mobile operations or those exempted; with many SMEs feeling that the 200kg exemption applied to all sites rather than just those on the exempt list. In addition, the broadening of the definition of hazardous waste (by the HWR 2005) caused confusion as SMEs could not understand what items were now classified as 'hazardous' especially since they were regarded as 'non-hazardous' under the old 'special' waste regime. The expansion of the definition of notified premises, is a clear reduction in burden for a number of SMEs and can be attributed to the work being conducted as part of the Better Regulation Agenda.

In total, 40.9% of SMEs complied with the 'premises notification' requirement, however, none of the SMEs from the printing, hotel or construction sectors complied. Fifty-five percent and 63.6% complied from the waste and construction sectors respectively. Although the scores were similar for the waste and manufacturing sectors, it was unusual that the scores from the waste sector were as low as they were. The audits identified that because many of the waste sites were classified as non-hazardous transfer stations (10 of 20) they did not feel it was necessary to notify their premises, even though they frequently (albeit unintentionally) received hazardous waste. Of the 10 non-hazardous transfer stations, only 2 had notified their premises even though all were found to have some hazardous waste on site.

A significant requirement in the regulations relates to the **movement of hazardous waste** and in particular the use and retention of CN; the regulations contain 5 main requirements. The *first* requirement relates to the use of 'consignment codes' and of the 44 SMEs assessed, only 20.4% of sites complied for all CN audited. Where the results are based on an assessment of those CN available, this figure rises to 66.7%, showing that when used, two thirds of CN included a consignment code. The highest results were seen in the manufacturing sector; 45.4% of SMEs audited and 72.7% of available CN.

The *second* requirement relates to the 'completion of CN'. Only 50% of SMEs had any CN available for audit (10 from the waste sector, 2 from printing, 9 from manufacturing and 1 from the construction sector). As a consequence, no single SME was able to show that all CN met the individual requirements as stipulated in Schedule 4 to the regulations. Of the 84 CN audited, 16.7% were identified as fully compliant; these coming from only 6 of the 44 sites. The waste industry scored highest with 19.1% of the 47 CN being identified as compliant. All CN including those in waste SMEs were assessed for waste leaving rather than waste entering the site.

Unlike the duty of care, a sample CN form is provided in the regulations. As a result, those SMEs using CN tended to complete the majority of the requirements; compliance scores were low because the regulations include all requirements under one regulation. The CN form is divided into 5 parts with 18 individual requirements. **Part A** relating to 'notification details' was generally well completed with scores ranging from 66% - 97%; the lowest scores in this section related to the requirement to provide a CN code as previously discussed. **Part B** relating to 'description of the waste', wasn't as well completed as Part A, in particular, over half of SMEs producing CN failed to record the Standard Industry Classification (SIC) code and although waste SMEs fared better in terms of producing EWC codes, less than half of the other SMEs failed to record the correct code. **Part C** relating to the 'carrier's certificate' was generally well completed with ~75% of CN audited including the carrier name, waste carrier and vehicle registration numbers and signatures; of those SMEs failing to meet the requirements the majority failed to record the time of collection which is an important requirement allowing producers and the EA to ascertain exact waste movements. **Part D** relating to 'consignor's certificate' wasn't as well completed as the carrier's certificate (~65%) which suggests that some CN were completed without the producer checking the contents or without any consultation at all. **Part E** relating to the 'consignee's certificate', was not assessed from a producer's perspective as they should not receive a copy on transfer. The information contained in Part E should eventually be provided to the producer in a 'consignee return'; this is covered later in this section of the paper. Anecdotal evidence from audits conducted on waste sites suggests that Part E of the CN was not well completed and thus this information was not passed back to the producers; this is a significant emission as it prevents producers from confirming that their waste has been properly managed.

The *third* requirement requires waste producers to follow a 'standard procedure' for completion of CN. This states that *inter alii*, producers are required to complete Parts A and B and then pass to the carrier to complete Part C. The carrier is then supposed to sign Part C and pass back to the producer to sign Part D and retain a copy. The carrier then must ensure that the CN travels with the consignment on delivery to the consignee. On receipt by the consignee, Part E must be completed with copies being retained by the carrier and consignee. None (0%) of the 44 SMEs and none (0%) of the individual CN audited were identified as following this standard procedure. This was due to a number of reasons, including, CN not being used or being completed retrospectively, CN being completed by the carrier with no or little input from the producer and CN not being completed correctly. Paperwork reviews and interviews with management and staff was the main way in which the above was assessed particularly as it was not possible to observe many actual transfers.

The final requirements in relation of the movement of waste relate to the 'schedule of carriers' and 'multiple collections'. Unfortunately, there were no occasions on which more than one carrier was used, therefore the schedule of carriers could not be assessed. Five sites were involved in multiple collections (waste being collected rather than transferred off site), with 2 sites complying; the compliant SMEs transported dangerous chemicals and thus tended to follow procedures.

Waste SMEs are required to keep specific **site records** including 'records of tipped (discharged) hazardous waste'. The results include those sites that unintentionally discharged hazardous waste (i.e. non-hazardous transfer stations). None of the 20 (0%) waste SMEs met this requirement. The regulations state that obligated sites must keep a site plan showing where hazardous waste is tipped as well as a regularly updated site register which includes the CN and a description of the waste.

All producers, holders or consignors of hazardous waste must keep 'records' of the quantity, nature, origin and where relevant, the frequency of collection, mode of transport, treatment methods and identify of the carrier; these records must be retained for 3 years. The EA (2009) has advised that this requirement can be met by keeping CN and consignee returns in a register for at least 3 years (which needs to be provided by the consignee within at least 1 month of the quarter end in which the waste was transferred). Even though it is the consignee who is obligated to produce the return, failure to have the return means that the register is NOT complete. Only 5 SMEs (11.9%) were judged to be compliant with this requirement; all from the waste sector. Moreover, all sites were required to follow a similar regulation covering 'registers and records: common provisions'. As this is linked to the aforementioned requirement, none (0%) of the non-waste SMEs met this requirement (although 1 site did keep a register for one hazardous waste type produced) with the 5 aforementioned waste SMEs and 2 others who were not required to keep producer details broadly meeting this requirement (35%). The main reason for these non-compliances relate to a failure for consignees to provide and/ or for producers to retain consignee returns and/ or CN. It is particularly worrying that many of the waste SMEs were not aware of the requirements nor where they being forced by the regulator. Further analysis of SMEs required to produce consignee returns showed that only 10% of waste SMEs (2 out of 20) kept evidence or were specifically aware of the requirement to provide returns to hazardous waste producers.

Those SMEs carrying hazardous waste (9 of the 20 waste SMEs) were also required to keep 'carrier records' for at least 12 months. The EA (2009) has suggested that this can be met by keeping copies of CN. Although only a small sample of CN were audited and it was not possible to know all the consignments that had taken place, this requirement was identified as being met by 100% of those involved.

Waste SMEs are also required to provide 'consignee quarterly returns' to the EA. Of the 20 SMEs audited, 8 (40%) were deemed to fulfil this obligation. When this information is compared against those consignees providing producers with quarterly returns (40% as opposed to 10%) it suggests that SMEs consider the returns to be provided to the EA as more important than those to be provided to their customers. It also suggests that there is more of a focus on providing the EA with returns rather than producers. Having said this, 60% of SMEs were not able to prove that they met this requirement **which is a significant yet relatively easy regulation to enforce**.

Although knowledge of the regulations was not as good as the duty of care, it tended to be better than for other regulations. In general, compliance with the 'spirit of the law' was poor as little effort was made to interpret requirements. The long and sometimes complex nature of parts of the regulations (as acknowledged by the Defra interviewee) is partly responsible for this.

There was a significant lack of enforcement activity compared to compliance levels which is partly due to none of the SMEs studied receiving any proactive enforcement contact or action from either the EA or LA. This research reflects national enforcement activity which shows that since the regulations were re-introduced in 2005, there had not been any enforcement action under the regulations. This was recognised by the Defra official who commented that it had not reviewed compliance; this may have been partly due to the interviewee thinking that compliance was "reasonable" (as reported to them by the EA).

Although this study was conducted prior to the amendment to the HWR (expanding those exempted from premises notification), according to the Explanatory Note (relating to the amendment to premises notifications) information provided by notification is used by the EA to facilitate the inspections of producers of hazardous waste required by the Hazardous Waste Directive. Despite this, very few of the businesses spoken to (if any) were inspected and none were specifically inspected for this purpose. Prior to the change, ~213,000 businesses were covered under the premises notification and therefore subject to inspection – this was reduced by ~73,000 because of the extension of the exemption. The need for inspection was identified by the Defra officer, but this was not identified by the EA when interviewed. No evidence was available to show the results of any inspections and the LA interviewed admitted to not having any involvement in compliance with the HWR.

Compliance with The Site Waste Management Plans Regulations

Three of the 44 SMEs audited were obligated under the regulations; all 3 SMEs fulfilled the role of the principal contractor (PC). Table 4.22 shows how the different requirements were met and Table 4.23 shows potential offences.

The results show that ‘letter of the law’ compliance was extremely poor with an overall compliance of 5.9%. Of the 3 sites obligated, only 1 had any awareness of the regulations; although they had attempted to compile a SWMP template this had not been used or updated and did not meet all the requirements. The above was compounded by a lack of co-ordination and ownership of regulatory duties by the EA and LA. The regulations state that a number of regulators “*may*” enforce the regulations, which has seemingly resulted in neither of the two principal enforcement bodies taking responsibility.

The regulations are extremely prescriptive and clearly set out each requirement, who is responsible and what the offence will result. The obligations are split between the client and the PC. For the purposes of this research, because none of the non-construction SMEs audited were undertaking any construction work which would fall under the regulations, they have been audited from a PC perspective only.

The regulations state that any client who intends to carry out a project on any one construction site with an estimate cost greater than £300,000 (ex. VAT) must ‘prepare a SWMP’ before work begins. Although the construction SMEs audited were not strictly required to prepare a SWMP as this fell on the client, the regulations state that if a project is started without a SWMP, then the client and the PC are both guilty of an offence. As a consequence, none (0%) of the sites audited met this requirement.

The regulations set out the ‘requirements for a SWMP’, it must:

- 1) Identify- a) the client; b) the PC; and c) the person who wrote it;
- 2) Describe the work proposed, including- a) the site location; b) the estimated project cost;
- 3) Record any decisions taken before the SWMP was drafted on the nature of the project, its design, construction method or material employed in order to minimise the quantity of waste on site;
- 4) (a) Describe each waste type expected to be produced; (b) estimate the quantity of each waste type; (c) identify the waste management action proposed for each waste type (inc. reusing, recycling, recover and disposal); and

5) Contain a declaration that the client and PC will take all reasonable steps to ensure that- (a) all site waste is dealt with in accordance with s. 34 of the EPA and the DoC Regulations; (b) materials will be handled efficiently and waste managed appropriately.

None of the SMEs audited were able to meet any of the above requirements. Although one SME was able to show that it had considered how it might meet the requirements, this was not sufficient enough to demonstrate compliance.

Two sites were required to 'update their SWMP (for projects of £500,000 or less)'. The following requirements had to be met:

1) Whenever waste is removed from the site the PC must record on the SWMP- (a) the identity of the person removing the waste; (b) the types of waste removed; and (c) the site that the waste is being taken to; and

2) Within 3 months of project completion the PC must add to the plan- (a) confirmation that the plan has been monitored on a regular basis and that the plan was updated; (b) an explanation of any deviations.

Neither of the two SMEs were able to demonstrate compliance, principally because they had not produced SWMPs in which they could update.

One site was required to 'Update its SWMP (for projects worth more than £500,000)'. The following requirements had to be met:

2) When any waste is removed the PC must record on the plan- (a) the identify of the person removing the waste; (b) the waste carrier registration number of the carrier; (c) a copy of, or reference to the written description required by s. 34 of the EPA; (d) the site the waste is being taken to and whether the operator of that site holds a permit under the EP Regulations 2007 or is an exempt waste operation;

3) As often as necessary to ensure that the plan accurately reflects project progress and in any event not less than every 6 months, the PC must: (a) review the plan; (b) record the types and quantities of waste produced; (c) record the types and quantities of waste that have been (i) reused, (ii) recycled or (iii) recovered in another way (state if on or off site for all 3), (iv) sent to landfill or (v) otherwise disposed of; and (d) update the plan to reflect the progress of the project; and

4) Within 3 months of project completion, the PC must add to the plan- (a) confirmation that the plan was monitored and updated in accordance with this regulation; (b) a comparison of the estimated quantities of each type against the actual quantities of each waste type; (c) an explanation of any deviations; and (d) an estimate of the cost savings that have been achieved by following the plan.

The obligated SME did not meet this requirement. Although the SWMP did allow for some of this information to be recorded, it was not felt to be robust enough to allow for individual waste movements to be recorded. The above 4th requirement could not be assessed as the project was not yet complete, however, it would be fair to surmise that this too would not have been met.

The PC must ensure that the SWMP is 'available'. The following requirements must be met:

(1) It must be kept (a) at the site office or (b) if no site office, at the site; and

(2) The PC must ensure that every contractor knows where it is kept and must make it available to any contractor carrying out work described in the plan.

Neither of these requirements were met as only 1 site had a SWMP available (although it was not complete) and there was no evidence of the SWMP being used or disseminated to any other contractors.

The regulations state that the PC 'must keep' the SWMP for 2 years after project completion; it must be kept at the PC's principal place of business or at the site of the project. None of the sites were able to demonstrate compliance with this requirement.

The regulations also set out a number of 'additional duties on the principal contractor' in the Schedules to the regulations. This states that:

- (1) The PC must as far as reasonably practicable ensure co-ordination of the work and co-operation among contractors during the construction phase;
- (2) The PC must ensure as far as reasonably practicable that every worker is provided with- (a) a site induction; and (b) any further information and training needed within the terms of the SWMP;
- 3) The PC must make and maintain arrangements that will allow him and the workers to co-operate effectively in promoting and developing measures to ensure that any waste arising on site is managed within the terms of the SWMP and in checking the effectiveness of such measures; and
- 4) The PC must ensure as far as reasonably practicable that waste produced during construction is reused, recycled or recovered.

Despite there being evidence on one site of the reuse of topsoil and brick, because a SWMP was not in use, none of the sites were able to demonstrate compliance with these additional duties.

None of the clients associated with any of the construction work had any awareness of the regulations and thus were not able to give reasonable directions to any contractor to enable the PC to comply with these regulations and thus they did not comply with the additional client duties.

In terms of the additional duties on both the client and the principal contractor, the following requirements had to be met:

- 1) Both the client and the PC must review, revise and refine the SWMP as necessary to ensure that any changes in respective roles and responsibilities are clearly communicated to those affected; and
- 2) Both must take reasonable steps to ensure that sufficient site security measures are in place to prevent the illegal disposal of waste from the site.

None of the sites were able to demonstrate compliance with the first requirement, however, all sites were judged to have met the requirements relating to site security.

Although the sample size was small, SMEs' knowledge and awareness of the regulations was extremely poor, with only one SME aware that the regulations existed.

The Defra interviewee confirmed that it hadn't investigated the levels of compliance; this was something they would look to do in the 3rd year after introducing the regulations. It was noted that even though the regulations hinge directly on the EPA/ DoC Regulations as well as the HWR, there was not a high appreciation for these other regulations. Moreover, a wide range of LAs were interviewed from across the NW of England and none had any knowledge of the regulations. Some cited the LA planning department as the authority responsible, but when they were interviewed they hadn't heard of the regulations either. Similarly, the EA thought the regulations would be enforced by the LA, with the EA officer not having any detailed knowledge of the regulations.

Compliance with the Control of Pollution (Amendment) Act and The Controlled Waste (Registration of Carriers and Seizure of Vehicles) Regulations

Twenty-four (54.5%) of the 44 SMEs assessed were classified as waste carriers and thus obligated under the Act/ associated regulations. Twenty of the obligated SMEs were from the waste sector with the remaining 4 from the construction sector. This was not surprising as this is the one of the waste sectors primary functions. The 4 sites from the construction sector were obligated because they carried construction and demolition (C & D) waste (among other things) and even though this could be considered their waste, C & D waste is excluded as an exempt waste type for the purpose of needing to register as a waste carrier. Only 1 construction SME was not carrying waste and thus not required to be registered.

Table 4.24 shows how the different requirements were met and Table 4.25 shows potential offences.

The results show that 'letter of the law' compliance was excellent with all SMEs fulfilling the requirement to be a registered waste carrier. As a consequence, no offences were identified under the regulations. Unfortunately, it was not possible to assess the requirements relating to the 'duty to return certificates', 'production of authority' and 'requirement to register as a professional collector of waste' as they were not applicable.

An assessment of the 'spirit of the law' showed that although SMEs were generally aware that they needed to register as waste carriers, they did not have any specific knowledge of the regulations themselves. Although this is not a specific requirement in itself, it demonstrates that if there are significant changes to legislation then they are reliant on other parties to inform them.

A potential non-compliance identified before the research related to the potential for SMEs to be operating with an out of date waste carrier's licence. Although this was not identified during the research, none of the SMEs had any system in place whereby they recorded the expiration date (every 3 years) and thus were at risk of this expiring. All SMEs tended to rely on having the licence on show to act as a reminder.

Defra confirmed that it felt there needed to be clarity on who the producer is for the purposes of the regulations. If carriers can claim they produced the waste (on behalf of the client) then they are exempt from registering (unless construction and demolition waste).

Generally, compliance with the regulations wasn't something that concerned SMEs or regulators. The limited number of requirements and simple registering system helped to ensure a high level of compliance.

Compliance with Waste Exemptions under The Environmental Permitting (England and Wales) Regulations

Table 4.26 shows compliance against relevant waste exemptions and Table 4.27 shows potential offences. All 44 SMEs were obligated by the regulations to some degree. In total, there were 16 notifiable exemptions (primarily in the waste and construction sector) and 48 non-notifiable exemptions (i.e. paragraphs 50 and 52).

The results show 'letter of the law' compliance at 64.1%. The printing and hotel sectors both scored 100% (they were only obligated under non-notifiable exemptions). The manufacturing sector scored lowest (46.2%) followed by the construction (56.3%) and waste sectors (66.7%).

The exemptions which were either not registered or not complied with, include: paragraphs 11 (0%), 17 (33.3%), 18 (33.3%), 19 (50%) and 41 (0%). Non-compliances included exceeding storage timescales, not covering hazardous waste and storing more waste than permitted. Although not observed, these offences clearly have the potential to cause environmental harm.

Knowledge of the exemptions, the conditions and registration process was poor. The onus to comply was very much on the business with no regulator checks or enforcement. These results reflect the national picture because at the time of the study there were no prosecutions for failing to register or meet an exemption.

In total, 10 potential offences were identified under Regulation 38(2) for notifiable exemptions and 13 offences for non-notifiable exemptions. Even though EPR 2010 has replaced EPR 2007, all the exemptions included in this study are still listed as exemptions (paragraphs 50 and 52 are now classified as Non Waste Framework Directive exemptions but still need to be complied with).

Discussion

The key points from this study have been grouped into the following categories: compliance levels, the impact and effectiveness of environmental legislation and environmental compliance control systems.

Compliance levels

This research has shown that ('letter of the law') compliance was poor (at best, moderate) with the command and control legislation audited (Tables 4.18, 4.20, 4.22 and 4.26). Due to there not being consistency in the design and enforcement of environmental legislation it is difficult to compare compliance between each regulation, i.e. The DoC Regulations list the requirements to be completed on a WTN, but the HWR encapsulate all the requirements under one regulation. More worryingly, if compliance was measured over a longer period of time, compliance is likely to deteriorate further.

Unless forced to, the SMEs made little effort to interpret requirements, comply or follow regulatory guidance ('spirit of the law'). Businesses failed to take ownership of the legislation, for instance, producers allowed waste carriers to take full responsibility for completion of waste transfer documentation on their behalf, believing that this was enough to ensure compliance. This resulted in a significant number of potential offences; although many were administrative, some were linked to environmental damage.

Knowledge, awareness and understanding of the legislation audited was generally poor, although knowledge of more established legislation such as the DoC and HWR was better than for newer regulations (e.g. SWMP); this was also because the DoC and HWR generally apply to all businesses as well as the regulations requiring specific paperwork to be completed (i.e. WTN, CN). Despite this, the more intricate requirements were not well known (e.g. hazardous waste registers and returns).

Although in some cases the sample size was low, these results are supported by a number of similar studies, including: Bland *et al.*, 2004, Fairman and Yapp, 2005, Wilson *et al.*, 2007, Taylor/ YouGov, 2007, Atkins, 2007, Wilson and Williams, 2008, Wilson *et al.*, 2009 and Wilson *et al.*, 2010.

Although SMEs saw 'compliance' as "*meeting the letter of the law*", this was viewed literally with it in practice being seen as what the regulator identified (this is supported by Wilson *et al.*, 2010). Although this is not an officially-agreed practice, the EA officer confirmed that they often deviate from the enforcement policy as they want to work with sites and encourage compliance. Moreover, due to the relevant regulators regarding the legislation audited as something they only *indirectly* regulate (stating that "*we get involved where we can*"), little attention was paid to ensuring compliance. Compliance was viewed as something to work towards over time with clear allowances in place for difficult market conditions. This resulted in many SMEs believing that they were compliant and/ or not committing any offences; Petts (2000) described this as being "*vulnerably compliant*".

Although the majority of the legislation audited was prescriptive, this did not seem to improve compliance, in fact it highlighted the areas that SMEs failed to comply with and/ or have difficulty understanding. This is because SMEs did not pay much attention to the regulations; this was compounded by the lack of enforcement and regulator persuasion to comply. Where regulations were supported with aide memoirs, compliance improved – an example of this was with the provision of a CN template within The HWR; although the results don't necessary show higher levels of compliance (because of the way they are prescribed) compliance with the CN requirements was better than for WTN under the DoC (SMEs had to come up with their own documentation).

When compliance with legislation that is 'indirectly' regulated is compared with legislation that is regulated via a registration system, then there is some evidence to suggest that awareness is better, there is more focus from the regulators and compliance improves. This is broadly supported by research conducted by Wilson *et al.*, (2010) who showed that where surveillance was in place, compliance and knowledge improved.

Impact and effectiveness of environmental legislation

It is important to distinguish between legislation that stipulates offences and that which sets out actual requirements; the latter of which is responsible for more of a regulatory burden. Crucially, this will only have a significant impact if the requirements are followed and enforced; this research suggests that much of the legislation audited, is not having a significant impact on SMEs. The authors consider the impact of regulation to be proportional to a combination of 'intention to comply' and 'regulatory pressure and enforcement'. Relatively speaking, there was little pressure to comply and thus a perception amongst SMEs that compliance isn't important.

For those SMEs that make an effort to comply, there is a significant 'accumulation' of environmental legislation. Therefore, it is crucial that when designing new regulations, this is considered by Government. From the discussions held with Government officials, there appeared to be little understanding of other related legislation as well as the overall environmental statute book and thus, what was considered reasonable in one set of regulations was not considered in the context of existing legislation.

The lack of enforcement of the SWMP Regulations was initially raised as a concern by Letsrecycle.com (2008) who reported that there was uncertainty over the exact role LA will play prior to implementation. The regulations give enforcement responsibility to both the EA and LA. However, LA indicated their uncertainty over their exact role. A role for planners was envisaged by some and the Defra consultation indicates that it expects enforcement to rest with “*local environmental quality, environmental health or trading standards enforcement teams*”. With no firm guidance, councils are uncertain as to what is expected of them in terms of enforcement. This initial concern manifested itself in the research because out of the LA contacted, none had any awareness of the regulations, their role and what was required to comply.

The EA said that it expected LA to take the majority of the burden with regards to enforcement, primarily because they have a lot more control on construction projects. Due to this lack of communication amongst regulatory authorities, at the present the SWMP Regulations are effectively being self-enforced by industry. As a consequence, it is recommended that the regulations are amended so that a body is given sole enforcement responsibilities and resource to manage compliance with these regulations.

Similarly, there was no formal enforcement action against those SMEs investigated from either the EA or LA for failure to meet compliance with the DoC, HWR or under the EPR. This is supported by Bland *et al.*, (2004), Benson *et al.*, (2006), Wilson and Williams (2008) and Warren (2006) who make similar conclusions about enforcement of environmental law. It is suggested that this legislation is not being enforced effectively. Surveillance of SMEs and enforcement activity as a result of non-compliances was very low. In general, SMEs are given the responsibility to organise their own compliance. Moreover, much of the surveillance is sporadic and backed up with limited resource. The consequence of this is a potential for environmental harm, with the potential for this being more obvious with failure to meet the DoC and HWR compared to producer responsibility legislation (Wilson *et al.*, 2010). Of the SMEs studied, there was evidence of direct pollution, with waste being poorly managed, allowed to escape and leached to the ground as well as indirect pollution by passing the problem onto someone else. In light of this, it is important to conceive legislation where compliance is inherently linked with environmental protection.

As a consequence, it could be suggested that whilst we have kept the ‘command’, we have lost the ‘control’ and perhaps on reflection left industry to self-regulate law that was not designed for this purpose.

Environmental compliance control systems

A great deal has been written about how we can improve legislation for SMEs as well as improve the mechanism by which legislation is enforced. A key discussion point from this research highlights the need to make certain environmental legislation more prescribed. Although not reflected in Government policy, prescriptive law, or at least a combination of it was preferred by the regulators and Government officials (in the interview discussions). If written correctly, prescriptive legislation can be easier to follow (i.e. SWMP) and can give clarity, but it must avoid complex exemptions and exclusions as they inevitably cause confusion and result in SMEs investing time identifying exemptions which negates the original benefits (this is supported by Hopkins, 1994). Although this may be viewed as an extension of regulation, Baylis *et al.*, (1998) and Petts *et al.*, (1999) suggest that more regulation can improve environmental performance.

Formal environmental management systems are often cited as a way for businesses to manage their compliance, however, the uptake by SMEs has been poor and this is primarily because of the outcome nature of the standard which makes it unclear as to what levels of control are appropriate.

At present, environmental regulation is difficult to audit from an SME perspective. Moreover, from a regulator point of view, it is easier to pick up non-compliances when the legislation is prescriptive as long as it is not too prescriptive as in parts of the HWR. This can result in one mistake leading to several non-compliances, for what is the same offence.

The authors make the following specific recommendations for the legislation researched:

- Amend the DoC Regulations so that an example WTN is contained in a schedule to the regulations (i.e. similar to the HWR).
- The duty of care could be better aligned with the HWR (i.e. documentation requirements).
- Amend the SWMP Regulations to:
 - replace the two thresholds (£300k and £500k) with one – the different requirements of each threshold causes confusion;
 - clarify the reference to enforcement – make one body solely responsible and provide resource to fulfil this function;
 - include additional definitions of key terms to provide clarity (as per CDM Regulations);
 - provide a link to the planning system so that SWMP can be completed/ checked as part of the planning process (perhaps a registration system).
- Review the use of the 'premises notification' registration system under the HWR. At present, this levies a tax on good operations, rather than targeting resource at firms who fly-tip. Registration systems can have a positive impact on compliance, but the revenue generated must be used to target those not complying. The raising of the requirement to notify premises from 200kgs to 500kgs and removal of exempt business types is identified as having a positive impact on SMEs.
- Parts of the HWR need to be reviewed as there are elements that are under prescribed (requirements relating to CN) and elements that are over-prescribed or duplicated (requirements relating to site records and returns); this results in multiple offences for one lapse.
- Where regulations are amended, record on the electronic version of the original legislation that amendments exist or provide consolidated versions of regulations (as provided in Acts of Parliament by the Ministry of Justice).
- Environmental law should only be introduced in common commencement dates (similar to other areas of law; i.e. April and October).
- Regulators and Government officials need staff with good levels of knowledge of a wide range of environmental legislation so there is a relativity check on what SMEs are being asked to comply with.
- Legislation should be designed so that it is easy to audit against from an SME and regulator perspective. Simple audit checks could then be built into existing regulator checks.

Due to SMEs not taking regulation as seriously as larger organisations, the level of environmental risk (being distinctive from the inherent 'hazard' associated with an activity) is much higher than the level of risk attributed by regulators. In contrast, it is perceived by the

authors that risk assessment has been used as a way to 'force' down regulator contact with SMEs (i.e. risk assessments are being used to justify, rather than inform the level of inspection required).

SMEs in this research were in favour of face-to-face support from regulators. This is supported by Williamson *et al.*, (2006) who reported that clear information on regulations was most important, closely followed by individual support (i.e. handholding). This is further supported by Fairman and Yapp (2005) and Alexopoulou (2007), the latter stating that regulatory inspections are the most effective and reliable compliance assessment method that can achieve an acceptable level of compliance with efficient use of regulator resources. This was not supported by Sniffer (2009) who was not able to predict the effect on levels of compliance of increasing or decreasing the rate of inspection. The Sniffer research appeared to be flawed methodologically as well as not appreciating other research conducted. For instance:

- The research didn't include any inspections – it evaluated inspections retrospective and thus didn't measure the right thing;
- It didn't consider sites not subject to inspection;
- It assumed that inspection effectiveness is absolute – failing to notice that it changes over time as the business evolves;
- Compliance needs to be assessed over a period of time to be properly measured; and
- There was no detail of the complexity of the audit or the length of time on site.

The different regulatory systems, business type and management level are too complicated for compliance and inspection frequency to be measured on their own. Although, it can never be absolute that more inspections will mean better compliance, it is believed that there is a level where compliance can be maximised.

Conclusions and Recommendations

The following key conclusions have been made:

- Letter of the law compliance was generally low (Tables 4.18, 4.20 and 4.22) to moderate (Table 4.26) except for compliance with the COP(A)A and associated regulations (Table 4.24).
- Spirit of the law compliance was poor (knowledge, awareness and understanding of the environmental legislation). Knowledge amongst enforcement officers, Government officials and SME support organisations was patchy and/ or limited to a narrow area of expertise.
- Environmental legislation can be complex and convoluted making it difficult to follow/ audit. There is a large number of regulators and Government bodies and support organisations but none with a holistic awareness and understanding of all the issues faced by SMEs.
- Enforcement activity and surveillance of SME compliance was very low; many SMEs seem to be given responsibility to manage their own compliance.
- There has not been any formal enforcement action against any of the SMEs studied despite a large number of offences identified (Tables 4.19, 4.21, 4.23 and 4.27); this reflects national enforcement levels and suggests that there is little pressure to comply and a perception amongst SMEs that compliance isn't important.
- SMEs considered compliance to be what the regulator identified rather than that in legislation. Although regulators had developed enforcement policies, these were

inconsistently followed, with being seen to be “*working with SMEs*” more important than regulating; deviation from enforcement policy was acceptable in a bid to encourage compliance over time.

- A reduction in the number of regulatory inspections increases the pressure on remaining inspections and negates the benefits from regular regulator contact.
- If the study was extended over a longer period of time, we expect compliance would be lower than presented. The legislation is too unauditible to identify total compliance from a snap-shot audit.
- There was evidence of direct and indirect environmental harm as a result of non-compliance. The potential for environmental harm was higher with failure to meet the DoC and HWR (e.g. waste being poorly managed) compared to producer responsibility legislation.
- Impact of environmental legislation is a combination of ‘intention to comply’ and ‘regulatory pressure and enforcement’. Due to some of the legislation not initiating any significant changes to behaviour or on-site operations, the impact in some cases was negligible.
- There is a significant ‘accumulation’ in the impact on SMEs if all applicable environmental legislation is followed; this is not appreciated by regulators and Government officials who appeared to work in silos.
- The implementation of new ‘command and control’ style legislation is evident, however, whilst we have kept the ‘command’ there is now much less ‘control’ which begs the questions: have we left industry to self-regulate law that was not designed for this purpose?

Clearly, further study is needed to understand all the issues relevant to environmental compliance in SMEs. Specific recommendations include:

- Developing a more sophisticated SME screening process in order to identify those SMEs that can pose a risk to the environment; in particular those SMEs not party to an inspection regime.
- SMEs need to be considered in smaller cohorts; including those of less than 50 staff and those not party to any inspection regime.
- Regulators need to use compliance auditing as part of their assessments; improving the link between compliance and environmental protection.
- SMEs need guidance and support to identify requirements and improve compliance control systems; the development of environmental compliance performance indicators (CPIs) is suggested as an initial improvement.
- The most efficient level of regulatory inspection frequency needs to be identified, so the point where inspections cease to be effective is identified.

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Tables

Table 4.18 Compliance with section 34 of the Environmental Protection Act and The Environmental Protection (Duty of Care) Regulations

Compliance by SME sector Legislative Requirement	A	B	C	D*	E	TOTAL
No. of SMEs audited	3	11	5	20	5	44
No. of SMEs obligated by the Act/ regulations	3	11	5	20	5	44
No. of waste deposits observed	2	0	0	100	3	105
No. of WTN available (based on deposits audited)	2	-	-	82	3	87/105
No. of WTN audited	6	42	7	100	47	202
Environmental Protection Act - section 34 (%)						
To prevent any contravention by any other person of section 33	2/3 66.7	5/11 45.5	2/5 40.0	12/20 60.0	3/5 60.0	24/44 54.6
To prevent any contravention by any other person of regulation 12 of the EP Regulations, or of a contravention of a condition of an EP	0/3 0	4/11 36.4	2/5 40.0	12/20 60.0	2/5 40.0	20/44 45.5
To prevent the escape of the waste from his control or that of any other person	2/3 66.7	6/11 54.5	5/5 100	11/20 55.0	1/5 20.0	25/44 56.8
On the transfer of the waste, to secure - (i) that the transfer is only to an authorised person or to a person for authorised transport purposes	0/3 0	0/11 0	0/5 0	9/20 45.0	0/5 0	9/44 20.5
On the transfer of the waste, to secure - (ii) that there is transferred such a written description of the waste....	0/3 0	0/11 0	0/5 0	0/20 0	0/5 0	0/44 0
TOTAL COMPLIANCE BY SECTOR (%)	26.7	27.3	36.0	44.0	24.0	
TOTAL COMPLIANCE WITH ACT (%)						35.5

Compliance by SME sector Legislative Requirement	A	B	C	D*	E	TOTAL
Environmental Protection (Duty of Care) Regulations						
WTN type versus waste type - actual/required & %	6/9 66.7	8/26 30.8	4/10 40.0	59/82 72.0	10/19 52.6	87/146 59.6
Transfer Notes %						
The transferor and transferee shall, at the same time as the written description is transferred, complete a transfer note and sign on their behalf	4/6 66.7 [1/2]	38/42 90.5	5/7 71.4	[53/82] [64.6]	40/47 85.1 [3/3]	140/184 76.1
A transfer note shall %: -						
Identify the waste according to EWC	2/6 33.3 [0/2]	35/42 83.3	6/7 85.7	[28/82] [34.1]	26/47 55.3 [0/3]	97/184 52.7
State its quantity	2/6 33.3 [0/2]	26/42 61.9	7/7 100	[48/82] [58.5]	7/47 14.9 [0/3]	90/184 48.9
State whether containerised or loose (see below)	-	-	-	-	-	-
State type of container, if applicable	2/4 50.0 [1/2]	27/42 64.3	7/7 100	[34/82] [41.5]	18/44 40.9 [2/3]	88/179 49.2
State the time and place of transfer	0/6 0 [0/2]	1/42 2.4	0/7 0	[20/82] [24.4]	11/47 [0/3] 23.4	32/184 17.4
Give the name and address of the transferor and transferee	4/6 66.7 [2/2]	41/42 97.6	6/7 85.7	[79/82] [96.3]	37/47 78.7 [2/3]	167/184 90.8
State whether the transferor is the producer or importer of the waste	4/6 66.7 [2/2]	35/42 83.3	7/7 100	[15/82] [18.3]	31/47 6.6 [2/3]	92/184 50.0
State if an authorised transport purpose applies	-	-	-	-	-	-
State which category (if any) the transferor and transferee falls and provide any additional information	0/6 0 [0/2]	11/42 26.2	4/7 57.1	[19/82] [23.2]	3/47 6.4 [1/3]	37/184 20.1
Duty to keep written descriptions of waste and transfer notes %						
WTN kept for a period of 2 years from the transfer - actual current WTNs available/ waste types produced	2/9 22.2 [0/2] (0/3) (0)	5/26 19.2 [-] (2/11)) (18.2)	4/10 40 [-] (2/5) (40)	[59/82] [72] (13/20) (65.0)	9/19 47.4 [1/3] (2/5) (40.0)	79/146 54.1 (19/44) (43.2)
Duty to furnish documents %						
Provide waste regulation authority with documentation when requested in writing within the specified time period	-	-	-	-	-	-
TOTAL COMPLIANCE BY SECTOR (%)	20/55 36.4 [6/18] [33.3]	219/3 62 60.5	46/6 6 69.7	[355/738] [48.1] 355/900 # 39.4#	182/392 46.4 [11/27] [40.7]	
TOTAL COMPLIANCE (%)	51.0 [39.4]					

WTN: waste transfer note

Square brackets [] refer to results for deposits audited only.

Round brackets () refer to results for total number of SMEs in that sector (actual/ potential and %).

*Results based only on deposits of waste with WTN available. If results were based on deposits only, totals would be out of 100 (i.e. the total number of deposits seen).

#Results if measured against total no. of deposits audited not just total no. of WTN available

KEY: Industry Type

Sector A: Printing

Sector B: Manufacturing

Sector C: Hotel/ Catering

Sector D: Waste

Sector E: Construction

Table 4.19 Potential offences under section 34 of the Environmental Protection Act and The Environmental Protection (Duty of Care) Regulations

Offence No.	Description	Relevant (√)
Section 33(1) (as linked to section 34) (as amended by the EPR)	<p>Subject to subsection (2) (in relation to household waste) and (3) (where other regulations exist) below a person shall not—</p> <p>(a) deposit controlled waste, or knowingly cause or knowingly permit controlled waste to be deposited in or on any land unless an environmental permit authorising the deposit is in force and the deposit is in accordance with the permit;</p> <p>(b) submit controlled waste, or knowingly cause or knowingly permit controlled waste to be submitted, to any listed operation (other than an operation within subsection 1(a) that—</p> <p>(i) is carried out in or on any land, or by means of any mobile plant, and</p> <p>(ii) is not carried out under and in accordance with an environmental permit.</p> <p>(c) treat, keep or dispose of controlled waste in a manner likely to cause pollution of the environment or harm to human health</p> <p>34(1A) Paragraphs (a) and (b) of (1) do not apply in relation to an exempt waste operation (as amended in Regulation 4 of Part 1 of Schedule 21 of the EP Regulations).</p> <p>34(1B) exempts activities under Ch. 2, Part 3 of the WRA, 1991, a waste operation which is subject to a licence under Part 2 of the FEP Act 1985 or due to an order under section 7 of that Act does not require a licence. The disposal of agricultural waste in or on land under an Reg.18 authorisation of the Groundwater Regulations, 1998.</p> <p>Section 59 of the EPA provides a power to require removal of waste unlawfully deposited under section 33(1).</p> <p>Section 42 and 43 of the Clean Neighbourhoods and Environment Act (CNEA) (2005) add a section (33B) to the EPA to allow investigation and enforcement and clean up costs to be charged to the prosecuted person under section 33.</p> <p>Section 44 of the CNEA adds section 33C to the EPA to force s.33 offenders to forfeit vehicles used in the offence.</p>	19

Offence No.	Description	Relevant (✓)
Section 34(5) & (6)	<p>34(6) – Any person failing to comply with the duty imposed in 34(1) or with any requirement under subsection (5) (further regulations imposed by the Secretary of State in relation to the making, retention and furnishing of documents) shall be liable.</p> <ul style="list-style-type: none"> - Includes 4 basic requirements in section 34(1); and - The DoC Regulations (1991) (s. 2, 3 and 4) 	EPA 1) 20 EPA 2) 24 EPA 3) – (above) EPA 4) 35 DoC) 44
	<p>Section 45 of the CNEA introduces section 34A (Fixed penalty notices for certain offences under section 34)- this relates to section 34(5) offences.</p> <p>Section 46 of the CNEA also introduces section 34B (Power to search and seize vehicles etc) which can be used if a s. 33 or 34 offence has occurred and a vehicle was used in the offence and section 34C (Seizure of vehicles etc: supplementary).</p>	
Section 47	<p>Receptacles for commercial or industrial waste (as amended by section 48 of the CNEA- allowing use of FPNs for s.47 offences).</p> <p>Section 47(6) a person who fails, without reasonable excuse, to comply with any requirements imposed under subsection (2) (nuisance caused by waste stored) or (4) (compliance with receptacle provisions) above shall be liable on summary conviction to a fine not exceeding level 3 on the standard scale.</p>	-
Section 157	<p>Offences by bodies corporate</p> <p>Where an offence under any provision of this Act committed by a body corporate is proved to have been committed with the consent or connivance of, or to have been attributable to any neglect on the part of, any director, manager, secretary or other similar officer of the body corporate or a person who was purporting to act in any such capacity, he as well as the body corporate shall be guilty of that offence and shall be liable to be proceeded against and punished accordingly (where the affairs of a body corporate are managed by its members, the above shall apply in relation to the acts or defaults of a member in connection with his functions of management as if he were a director of the body corporate.</p>	-
Section 158	<p>Offences under Parts I, II, IV, VI, etc. due to fault of others</p> <p>Where the commission of an offence by any person under Part I, II, IV, or VI, or section 140, 141 or 142 above is due to the act or default of some other person, that other person may be charged with and convicted of the offence by virtue of this section whether or not proceedings for the offence are taken against the first-mentioned person.</p>	-
Defences	<p>These are contained in section 33(7), although “<i>acting under an employer’s instructions</i>” is no longer a defence as it was removed by the Clean Neighbourhoods and Environment Act 2005 (Schedule 5, Part 4 [waste])</p>	-
The Environmental Protection (Duty of Care) Regulations 1991 (as amended)		
No separate offences in the regulations	<p>Section 34(5) of the EPA (1990) makes it an offence to breach any aspect of the Duty of Care regulations.</p> <p>Section 34(5) specifically relates to s.2 (transfer notes), s.3</p>	-

Offence No.	Description	Relevant (√)
	(duty to keep copies of written descriptions of waste and transfer notes) and s.4 (duty to furnish documents) of the DoC Regulations.	

EP: Environmental Permitting
FPN: Fixed Penalty Notice

WRA: Water Resources Act
FEP: Food and Environmental Protection

Table 4.20 Compliance with The Hazardous Waste (England and Wales) Regulations

Compliance by SME sector	A	B	C	D	E	TOTAL
Legislative Requirement						
No. of sites audited (actual no.)	3	11	5	20	5	44
No. of sites obligated by the regulations	3	11	5	20	5	44
No. of consignment notes (CN) audited	2	33	0	47	2	84
CN type vs. hazardous waste type (%)	2/8 25.0	14/34 41.2	0/11 0	21/51 41.2	1/15 6.7	38/119 31.9
Compliance with the Hazardous Waste Regulations 2005						
Mixing Hazardous Waste (%)						
Prohibition on mixing hazardous waste with a permit	33.3	45.4	20.0	30.0	40.0	34.1
Duty to separate mixed waste	0 [2]	0 [6]	0 [4]	0 [14]	0 [3]	0 [29]
Notification of Premises (%)						
Requirement notify premises	0	63.6	0	55.0	0	40.9
Prohibition on removal of hazardous waste from premises unless notified or exempt	0	63.6	0	55.0	0	40.9
Notification by producer	0	63.6	0	55.0	0	40.9
Consignment Notes (%)						
Consignment codes	#0	#45.4	#0	#15	#20	#20.4
#by SME	[3]	[11]	[5]	[20]	[5]	*66.7
*by CN audited	*0	*72.7	*0	*66.0	*50.0	
	[2]	[33]	[0]	[47]	[2]	
Completion of consignment notes	#0	#0	#0	#0	#0	#0
#by SME	[3]	[11]	[5]	[20]	[5]	*16.7
*by CN audited	*0	*15.2	*0	*19.1	*0	
	[2]	[33]	[0]	[47]	[2]	
Standard procedure	#0	#0	#0	#0	#0	#0
#by SME	[3]	[11]	[5]	[20]	[5]	*0
*by CN audited	*0	*0	*0	*0	*0	
	[2]	[33]	[0]	[47]	[2]	
Schedule of carriers	-	-	-	-	-	-
Multiple collections	-	0 [3]	-	100 [2]	-	40.0
Duty of consignee not accepting delivery	-	-	-	-	-	-
Further CN rejected consignment	-	-	-	-	-	-
Procedure for rejected multiple collection consignments	-	-	-	-	-	-
Duty to deliver consignment promptly	-	-	-	-	-	-
Site records						
Records of tipped (discharged) hazardous waste	-	-	-	0 [20]	-	0
Records of disposal or recovery of hazardous	-	-	-	-	-	-

Compliance by SME sector	A	B	C	D	E	TOTAL
Legislative Requirement						
waste by other means						
Producers', holders' and consignors' records	0	0	0	27.8 [18]	0	11.9
Carrier's records	-	-	-	100 [9]	-	100
Registers and records: common provisions	0	0	0	35.0	0	15.9
Previous holder's right to information	-	-	-	-	-	-
Consignee and self-disposal quarterly returns	-	-	-	40.0	-	40.0
Consignee's return to the producer, holder or consignor	-	-	-	10.0	-	10.0
Duty to supply information	-	-	-	-	-	-
TOTAL COMPLIANCE BY SECTOR (%)	3.4	28.7	2.0	28.5	6.3	
TOTAL COMPLIANCE (%)	22.3					

Unbracketed scores are in percentages.

Bracketed [] scores relate to the total no. of SMEs obligated by the regulations for that sector. Where no brackets are given it is to be assumed that the percentages relate to the total no. of SMEs bound by the regulations (i.e. waste SME percentages are mostly out of 20, unless otherwise stated).

KEY: Industry Type

Sector A: Printing

Sector B: Manufacturing

Sector C: Hotel/ Catering

Sector D: Waste

Sector E: Construction

Table 4.21 Potential offences under The Hazardous Waste (England and Wales) Regulations

Offence No.	Description	Relevant (√)
Part 10- Regulation 65 Offences		
It is an offence for a person to fail to comply with any requirement imposed on them by or under the following provisions of these regulations: -		
a) Part 4	Mixing hazardous waste Includes regulations 18, 19 and 20 18- meaning of mixing hazardous waste 19- prohibition on mixing hazardous waste without a permit 20- duty to separate mixed wastes	58
b) Regulations 21, 22, 24-26	Notification of premises 21- requirement to notify premises 22- prohibition on removal of hazardous waste from premises unless notified or exempt 24- notification by producer 25- notification by consignor 26- common provisions on notification	78
c) Regulation 34-44	Movement of hazardous waste Consignment notes 34- consignment codes 35- completion of consignment notes 36- standard procedure 37- schedule of carriers 38- multiple collections 39- removal of ships' wastes to reception facilities 40- removal of ships' wastes other than to reception facilities 41- removal of wastes by pipeline	185

Offence No.	Description	Relevant (✓)
	42- duty of consignee note accepting delivery 43- further consignment note for rejected consignment 44- procedure for rejected multiple collection consignment	
d) Regulation 46 and Schedule 7	46- cross border movements of hazardous waste Schedule 7- UK cross border movement of hazardous waste (s.1-7)	-
e) Part 7 (with the exception of Regulation 52); and	47- records of tipped (discharged) hazardous waste 48- records of disposal or recovery of hazardous waste by other means 49- producers', holders' and consignors' records 50- carrier's records 51- registers and records: common provisions 53- consignee and self-disposal quarterly returns 54- consignee's return to the producer, holder or consignor 55- duties to supply information	126
Regulation 62	62- general duties on the holder in the event of an emergency or grave danger	N/A
Defences Regulation 66	- Acting under an emergency or in grave danger and took all steps that were reasonable practicable in the circumstances to minimise harm any threat to the public or the environment and ensured that the provision were complied with as reasonably practically after the event; of - if there was no emergency, he took all reasonable measures and exercised due diligence to avoid the offence	-

S. 62 offences under the EPA have been removed by the Hazardous Waste Regulations 2005. There is a new s. 62A, however this just clarifies that the Secretary of State has to implement further regulations in order to classify other wastes as hazardous.

Table 4.22 Compliance with The Site Waste Management Plans Regulations

Compliance by SME sector	E TOTAL
Legislative Requirement	
No. of SMEs audited	44
No. of SMEs obligated	3
Appointment of principal contractor (PC (%))	
A client must appoint a PC (if the work is carried out by the client then they become the PC)	-
Preparation of a SWMP (%)	
Any client who intends to carry out a project on any one construction site with an estimate cost greater than £300,000 (ex. VAT) must prepare a SWMP before work begins	(0/3) 0
Requirements for a SWMP (%)	
(1) A SWMP must identify- a) the client; b) the PC; and c) the person who wrote it	(0/3) 0
(2) It must describe the work proposed, including- a) the site location; b) the estimated project cost	(0/3) 0
(3) It must record any decisions taken before the SWMP was drafted on the nature of the project, its design, construction method or material employed in order to minimise the quantity of waste on site	(0/3) 0
(4) It must (a) describe each waste type expected to be produced; (b) estimate the quantity of each waste type; (c) identify the waste management action proposed for each waste type (inc. reusing, recycling, recover and disposal)	(0/3) 0

Compliance by SME sector	E TOTAL
Legislative Requirement	
(5) It must contain a declaration that the client and PC will take all reasonable steps to ensure that- (a) all site waste is dealt with in accordance with s. 34 of the EPA and the EP DoC Regulations; (b) materials will be handled efficiently and waste managed appropriately	(0/3) 0
Updating a SWMP for a project of £500,000 or less (%)	
(1) For projects with an estimated cost of £500,000 or less, whenever waste is removed from the site the PC must record on the SWMP- (a) the identify of the person removing the waste; (b) the types of waste removed; and (c) the site that the waste is being taken to	(0/2) 0
(2) Within 3 months of project completion the PC must add to the plan- (a) confirmation that the plan has been monitored on a regular basis and that the plan was updated; (b) an explanation of any deviations	(0/2) 0
Updating a SWMP for a project worth more than £500,000 (%)	
(1) For projects estimated to be worth more than £500,000 the PC must update the SWMP	(0/1) 0
(2) When any waste is removed the PC must record on the plan- (a) the identify of the person removing the waste; (b) the WC registration number of the carrier; (c) a copy of, or reference to the written description required by s. 34 of the EPA; (d) the site the waste is being taken to and whether the operator of that site holds a permit under the EP Regulations 2007 or is an exempt waste operation	(0/1) 0
(3) As often as necessary to ensure that the plan accurately reflects project progress and in any event not less than every 6 months, the PC must: (a) review the plan; (b) record the types and quantities of waste produced; (c) record the types and quantities of waste that have been (i) reused, (ii) recycled or (iii) recovered in another way (state if on or off site for all 3), (iv) sent to landfill or (v) otherwise disposed of; and (d) update the plan to reflect the progress of the project.	(0/1) 0
(4) Within 3 months of project completion, the PC must add to the plan- (a) confirmation that the plan was monitored and updated in accordance with this regulation; (b) a comparison of the estimated quantities of each type against the actual quantities of each waste type; (c) an explanation of any deviations; and (d) an estimate of the cost savings that have been achieved by following the plan.	0/0 -
Availability of the plan (%)	
(1) The PC must ensure that the SWMP is kept- (a) at the site office or (b) if no site office, at the site	(0/3) 0
(2) The PC must ensure that every contractor knows where it is kept and must make it available to any contractor carrying out work described in the plan	(0/3) 0
Keeping plans (%)	
The PC must keep the SWMP for 2 years after the project completion at the PC's principal place of business or at the site of the project	(0/2) 0
Additional duties on the principal contractor (%)	
(1) The PC must AFARP ensure co-ordination of the work and co-operation among contractors during the construction phase	(0/3) 0
(2) The PC must ensure AFARP that every worker is provided with- (a) a site induction; and (b) any further information and training needed within the terms of the SWMP	(0/3) 0
(3) The PC must make and maintain arrangements that will allow him and the workers to co-operate effectively in promoting and developing measures to ensure that any waste arising on site is managed within the terms of the	(0/3) 0

Compliance by SME sector	E TOTAL
Legislative Requirement	
SWMP and in checking the effectiveness of such measures.	
(4) The PC must ensure AFARP that waste produced during construction is reused, recycled or recovered.	(0/3) 0
Additional duties on the client (%)	
The client must give reasonable directions to any contractor AFARP to enable the PC to comply with these regulations	-
Additional duties on both the client and the principal contractor (%)	
(1) Both the client and the PC must review, revise and refine the SWMP as necessary to ensure that any changes in respective R&R are clearly communicated to those affected	(0/3) 0
(2) Both must take reasonable steps to ensure that sufficient site security measures are in place to prevent the illegal disposal of waste from the site	(3/3) 100
TOTAL COMPLIANCE (%)	5.9

SWMP: Site Waste Management Plan

PC: Principal Contractor

WC: Waste Carrier

AFARP: As far as reasonably practicable

VAT: Value Added Tax

KEY: Industry Type**Sector E:** Construction**Table 4.23 Potential offences under The Site Waste Management Plans Regulations**

Offence No.	Description	Relevant (√)
Regulation 5	Preparation of a SWMP If a project is started without a SWMP, the client and the PC are both guilty of an offence.	3
Regulation 7	Updating a SWMP for a project of £500,000 or less*	2
Regulation 8	Updating a SWMP for a project worth more than £500,000*	1
Regulation 9	Availability of the plan*	3
Regulation 10	Keeping plans*	2
Regulation 11 Paragraph 1 (in the Schedule)	Additional duties (see Schedule to the Regulations) Additional duties on the PC*	3
Regulation 11 Paragraph 2 (in the Schedule)	Additional duties (see Schedule to the Regulations) Additional duties on the client*	-
Regulation 11 Paragraph 3 (in the Schedule)	Additional duties (see Schedule to the Regulations) Additional duties on both the client and PC*	3
Regulation 12	False statements It is an offence knowingly or recklessly to make a false or misleading statement in a site waste management plan	-
Regulation 13	Obstruction Any person who- (a) intentionally obstructs any person acting in the execution of these Regulations; (b) without reasonable cause, fails to give any person acting in the execution of these Regulations any assistance or information that that person may reasonably require under these Regulations; (c) furnishes to any person acting in the execution of these	-

Offence No.	Description	Relevant (√)
	Regulations any information knowing it to be false of misleading; or (d) fails to produce a SWMP or any other record when required to do so by any person acting in the execution of these Regulations is guilty of an offence Where a person has contravened regulation 13(d) may give that person a FPN of £300	

*Failure to comply with this regulation is an offence

Regulation 16 (Penalties)- A person guilty of any offence under these Regulations is liable on summary conviction, to a fine not exceeding £50,000; or on conviction on indictment, to a fine.

Regulation 17 (Transitional arrangement)- these regulations do not apply in relation to a project planned before the coming into force of these Regulations but where the construction work begins before 1st July 2008.

Table 4.24 Compliance with The Control of Pollution (Amendment) Act and The Controlled Waste (Registration of Carriers and Seizure of Vehicles) Regulations

Compliance by SME sector Legislative Requirement	D	E	TOTAL
No. of SMEs audited	20	5	25
No. of SMEs obligated- there were no obligated SMEs from sector's A, B, C	20	4	24
Compliance with the Control of Pollution (Amendment) Act			
Offence of transporting controlled waste without registering (%)			
Transporting waste for profit without being registered	100	100	100
Compliance with The Controlled Waste (Registration of Carriers and Seizure of Vehicles) Regulations			
Exemption from registration			
Company not required to be a registered carrier for the purposes of section 1	-	(1) 100	100
Duty to return certificates (%)			
Return certificate of registration where it ceases to have effect	-	-	-
Production of authority (%)			
Where required under section 5 of the Act to produce an authority for transporting waste and can't produce it immediately, he shall produce it at or send it no later than 7 days after the day on which he was required to produce it	-	-	-
Registration by professional collectors and transporters of waste, and by dealers and brokers (under paragraph 12, schedule 4 of the WML Regulations) (%)			
Offence of failing to register as a professional collector or transporter of waste	-	-	-
TOTAL COMPLIANCE BY SECTOR (%)	100	100	
TOTAL COMPLIANCE WITH REGULATIONS (%)	100		

Actual numbers are given in round brackets (), potential numbers in square brackets [] and percentages are un-bracketed.

KEY: Industry Type
Sector D: Waste
Sector E: Construction

Table 4.25 Potential offences under The Control of Pollution (Amendment) Act and The Controlled Waste (Registration of Carriers and Seizure of Vehicles) Regulations

Offence No.	Description	Relevant (√)
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Offence No.	Description	Relevant (√)
Control of Pollution (Amendment) Act (1989)		
Section 1	Offence of transporting controlled waste without registering (under COP(A)A 1989)	-
Section 5	Power to require produce of authority, stop and search etc (as amended by the Clean Neighbourhoods and Environment Act (2005) (Part 5 [waste], Chapter 1 [transport of waste], s. 37) (section 5A allows the authority to seize vehicles under CNEA (2005) (section 5B(2) also allows the authority to issues FPNs for not being able to produce authority to carry waste)	-
Section 6(9)	Any person who intentionally obstructs any authorised officer or constable in the exercise of any power conferred by virtue of a warrant under this section shall be guilty of an offence	-
Section 7(3)	Further enforcement provisions- A person shall be guilty of an offence under this subsection if he— (a) fails, without reasonable excuse, to comply with any requirement in pursuance of regulations under this Act to provide information to the Secretary of State or a disposal authority; or (b) in complying with any such requirement, provides information which he knows to be false in a material particular or recklessly provides information which is false in a material particular.	-
Defences Section 1(4)	It shall be a defence for that person to show— (a) that the waste was transported in an emergency of which notice was given, as soon as practicable after it occurred, to the disposal authority in whose area the emergency occurred; or (b) that he neither knew nor had reasonable grounds for suspecting that what was being transported was controlled waste and took all such steps as it was reasonable to take for ascertaining whether it was such waste; or (c) that he acted under instructions from his employer (this was removed under the Clean Neighbourhoods and Environment Act 2005 (Part 5 [waste], Chapter 1 [transport of waste], s. 35)	-
The Controlled Waste (Registration of Carriers and Seizure of Vehicles) Regulations (1991)		
Sections 1, 5, 6(9) and 7(3)	As specified in COP(A) 1989.	-
Sections 23(1), 33, 34(6), 44, 47(6), 57(5), 59(5), 63(2), 69(9), 70(4), 71(3) and 80(4) of the Environmental Protection Act 1990	Section 23(1)- list of offences under the EPA; inc. obstructing an enforcement officer, failing to provide information Section 33- prohibition on unauthorised or harmful deposit, treatment or disposal etc. of waste Section 34(6)- see EPA, s.34 audit Section 44- offences of making false statements Section 47(6)- receptacles for commercial or industrial waste Section 57(5)- power of Secretary of State to require waste to be accepted, treated, disposed of or delivered Section 59(5)- powers to require removal of waste unlawfully deposited Section 63(2)- deposits of waste other than controlled waste Section 69(9)- powers of entry of inspectors	-

Offence No.	Description	Relevant (√)
	Section 70(4)- obstructing an inspectors power to deal with a cause of imminent danger of serious pollution Section 71(3)- obtaining of information from authorities or individuals Section 80(4)- contravention of failure to comply with an abatement notice (regarding statutory nuisances)	

CNEA: Clean Neighbourhoods and Environment Act

Table 4.26 Compliance with exemptions under schedule 3 to The Environmental Permitting (England and Wales) Regulations

Compliance by SME sector	A	B	C	D	E	TOTAL
Legislative Requirement						
No. of sites audited (actual no.)	3	11	5	20	5	44
No. of sites obligated by the regulations	3	11	5	20	5	44
No. of notifiable exemptions	0	2	0	7	7	16
No of non-notifiable exemptions	3	11	5	20	9	48
Compliance with Schedule 3 to The Environmental Permitting Regulations 2007						
Exemptions (%)						
Paragraph 7 Waste for the benefit of land	-	-	-	(1) 100	-	100
Paragraph 11 Preparatory treatment of waste	-	(2) 0	-	-	-	0
Paragraph 17 Storage of waste in a secure place	-	-	-	-	(3) 33.3	33.3
Paragraph 18 Waste in secure containers	-	-	-	-	(3) 33.3	33.3
Paragraph 19 Waste for construction	-	-	-	(2) 50.0	-	50.0
Paragraph 40 Repair of refurbishment of WEEE	-	-	-	(1) 100	-	100
Paragraph 41 Secure storage of WEEE	-	-	-	(3) 0	-	0
Paragraph 50 Storing non-liquid waste pending its management elsewhere	-	-	-	-	(4) 50	50.0
Paragraph 52 Temporary storage of waste on the site where it was produced	(3) 100	(11) 54.5	(5) 100	(20) 75.0	(5) 80.0	75.0
PPC Crushing exemption	-	-	-	-	(1) 100	100
TOTAL COMPLIANCE BY SECTOR (%)	100	46.2	100	66.7	56.3	
TOTAL COMPLIANCE (%)	64.1					

WEEE: Waste Electrical and Electronic Equipment

KEY: Industry Type

Sector A: Printing

Sector B: Manufacturing

Sector C: Hotel/ Catering

Sector D: Waste

Sector E: Construction

Table 4.27 Potential offences under schedule 3 to The Environmental Permitting (England and Wales) Regulations

Offence No.	Description	Relevant (√)
Part IV Regulation 38(1) It is an offence for a person—		
Regulation 38(1)	(a) to contravene, or knowingly cause or knowingly permit the contravention of regulation 12 (requirement for an environmental permit).	-
	(b) to fail to comply with or to contravene an environmental permit condition.	-
	(c) to fail to comply with the requirements of an enforcement notice, a suspension notice or a landfill closure notice.	-
	(d) to fail to comply with a notice under regulation 60(2) requiring the provision of information, without reasonable excuse.	-
	(e) to make a statement which he knows to be false or misleading in a material particular, or recklessly to make a statement which is false or misleading in a material particular, where the statement is made— (i) in purported compliance with a requirement to provide information imposed by or under a provision of these Regulations, or (ii) for the purpose of obtaining the grant of an environmental permit to himself or another person, or the variation, transfer in whole or in part, or surrender in whole or in part of an environmental permit.	-
	(f) intentionally to make a false entry in a record required to be kept under an environmental permit condition.	-
	(g) with intent to deceive— (i) to forge or use a document issued or authorised to be issued or required for any purpose under an environmental permit condition, or (ii) to make or have in his possession a document so closely resembling such a document as to be likely to deceive.	-
Regulation 38(2)	It is an offence for an establishment or undertaking to— (a) fail to comply with paragraph 9 or 12(3) of Schedule 2 (exemptions); or (b) intentionally make a false entry in a record required to be kept under paragraph 12(3) of Schedule 2.	10 (13)
Regulation 38(3)	If an offence committed by a person under this regulation is due to the act or default of some other person, that other person is also guilty of the offence and liable to be proceeded against and punished accordingly.	-
Regulation 41	Offences by bodies corporate (1) If an offence committed under these Regulations by a body corporate is shown, (a) to have been committed with the consent or connivance of an officer; or (b) to be attributable to any neglect on his part, the officer as well as the body corporate is guilty of the offence. (2) If the affairs of a body corporate are managed by its members, paragraph (1) applies in relation to the acts and defaults of a member in connection with his functions of management as if he were a director..	-
Defence Regulation 40	Acts done in an emergency It is a defence for a person charged with an offence under regulation 38(1)(a), (b) or (c) to prove that the acts alleged to constitute the contravention were done in an emergency in order to avoid danger to human health in a case where— (a) he took all such steps as were reasonably practicable in the circumstances for minimising pollution; and (b) particulars of the acts were furnished to the regulator as soon as reasonably practicable after they were done.	-

Penalties for these offences are set out in Regulation 39 with fines up to £50,000 or a sentence not exceeding 12 months for summary convictions and to a fine or imprisonment not exceeding 5 years if convicted on indictment.

Regulation 44 also gives courts the power to order the cause of offences (in addition to or instead of) to be remediated.

4.2.8 Wilson, C, D, H; Williams, I, D and Kemp, S (2011)

An Evaluation of the Impact and Effectiveness of Environmental Legislation in Small and Medium-Sized Enterprises: Experiences from the UK. Business Strategy and the Environment. *In-press.*

This paper presents findings following an investigation into the impact and effectiveness of environmental legislation. Interviews were conducted with SME management, site staff, regulators, policy officials and support organisations. Forty-four SMEs from the north-west of England participated in the study and overall, a total of 99 individuals were interviewed.

This paper refers to the research conducted as part of the author's final PhD submission and forms part of the discussion and conclusions in Chapters 5 and 6.

See below for a full copy of the paper.

An Evaluation of the Impact and Effectiveness of Environmental Legislation in Small and Medium-Sized Enterprises: Experiences from the UK

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Abstract

With Small- and Medium-Sized Enterprises (SMEs) accounting for 99.7% of the 4.7m UK businesses, they can have a huge collective impact on the environment, which in turn, is increasingly regulated. This study investigated the impact and effectiveness of environmental legislation on UK SMEs as well as determining if 'compliance' results in improved environmental protection. Interviews were conducted with SME management, site staff, regulators, policy officials and support organisations. Forty-four SMEs from the north-west of England participated in the study and overall, a total of 99 individuals were interviewed. The study clearly indicates that the impact of environmental legislation on SMEs is overstated and impact increased commensurate with effort to comply and enforcement action. Only 1 of the SMEs studied had been prosecuted and only 2 had been inspected. Compliance issues identified in those SMEs subject to direct regulation did not correlate with previous compliance audits conducted. In general, SMEs had poor awareness of compliance issues; non-compliance was only really recognised and acknowledged if identified by a regulator and only regarded as serious if prosecuted. Regulation of the environment is clearly only effective if complied with; understanding compliance levels can help measure the link between legislation and environmental protection. The effectiveness of environmental legislation can only be understood if SMEs are subject to regular regulatory contact. Recommendations to improve SME compliance control systems are provided.

Introduction

Although the 'better regulation' agenda precedes the UK Government's 2011 post-recession efficiency savings, it is clear that these two initiatives will dove-tail over the coming years. Environmental issues have the potential to have a significant impact on the profitability and sustainability of businesses. The 'environment' is a particularly heavily regulated area of business, with over 80,000 pages of European legislation (Williamson *et al.*, 2006), 500 EU Directives (Ebbage, 2009); since 1997, more environmental legislation has gone through the UK parliament than any other area of law, except that covering finance and justice (Ends, 2008).

With SMEs accounting for 99.7% of the 4.7m UK businesses, 47.5% of employment and 48.7% of turnover, they are extremely important to the UK economy (Richard, 2007). They are defined as businesses employing <250 members of staff, having a turnover of <€50 million and/ or an annual balance sheet of <€43 million (European Commission, 2006). Although this definition is widely recognised, this includes a wide range of business types and sizes. SMEs can be anything from a small corner shop to a nationally operating business. As a consequence, it is difficult to consider 'SMEs' as a homogenous group (Hillary, 2000 and Merritt, 1998).

Research shows that SMEs have low levels of awareness and understanding of environmental issues (Taylor/ YouGov, 2007 and Atkins, 2007) as well as low levels of compliance with specific legislation (Bland *et al.*, 2004, Fairman and Yapp, 2005, Wilson *et al.*, 2007, 2009, 2010, 2011 and Wilson and Williams, 2008). Activity to enforce breaches of UK environmental legislation is relatively low and does not correlate with independently assessed levels of compliance. Statistics from the Environment Agency (EA) show that in 2008, it prosecuted 251 companies, with over £3m awarded in fines (an average of £12,014). Thirty-one percent of prosecutions related to "illegal waste activity", 24% to "water pollution", 23% to "producer responsibility" offences and 22% to "other" offences (EA, 2008). Although the annual number of fines is consistent, average fines are marginally increasing.

Even though they may be individually small, because of the large number of UK SMEs, they can have a huge collective impact on the environment. Although the risk of pollution is said to be falling (EA, 2008b), the EA has suggested that up to 80% of environmental incidents are caused by SMEs (this is supported by Hillary, 2000, Williamson *et al.*, 2006, Fairman and Yapp, 2005 and Wilson *et al.*, 2011). However, the EA (2008b) acknowledged that it tends to concentrate its efforts on certain larger organisations (non-SMEs) that it feels it is responsible for and who are perceived to have a higher potential to pollute. Following the 2007-11 worldwide economic crisis budgets will clearly be restricted and resources stretched. Nevertheless, there remains a need to balance financial restrictions with environmental protection.

Purpose of the study

This study builds on and complements findings from previous research conducted by Wilson *et al.*, (2007, 2009, 2010 and 2011 [in-press]) and Wilson and Williams (2008). It is part of a substantial project investigating the legal performance of SMEs with environmental legislation. Previous research focused on determining SME compliance levels with the 'spirit' and 'letter' of the law as well as determining SME awareness and perception of legislation.

This study aimed to:

- Analyse, compare and contrast the **implementation** of environmental legislation, based on the experiences of SMEs, regulators and policy makers;
- Analyse, compare and contrast the **enforcement** action as a result of non-compliance, based on the experiences of SMEs, regulators and policy makers; and
- Determine if compliance with environmental legislation results in improved **environmental protection** and vice versa.

Impact and Effectiveness of Environmental Legislation

The intended goal of environmental regulation is to protect the environment. UK environmental policy has traditionally followed a 'command and control', reactive approach, based on negotiation between industry and Government (Wilson *et al.*, 2011). The impact and effectiveness of environmental legislation can be considered from a number of perspectives; including, the impact on the SME (i.e. during implementation, its accumulation and through enforcement) as well as how effectively it protects the environment.

Impact on SMEs

A traditional, although not exclusive, view of regulation is that it restricts UK businesses (Ainley, 1995). This view is not necessarily consistent across other EU countries as highlighted by Triebswetter and Hitchens (2005) whose results showed that the regulation of waste water, packaging waste and clean air led neither to an improvement nor to a loss in overall competitiveness in the German manufacturing industry. This is supported by Williamson *et al.*, (2006b) who suggested that there was no conclusive evidence of the negative impact of regulation on economic growth due to the difficulties of separating regulation from other factors that may impinge on firm performance. Williamson *et al.*, (2006b) explained that regulation plays an important role as it bridges the gap between a firm's profit-orientated self-interest and the interests of society. If one business did not have to comply then that would be a big advantage; this would disappear if no one had to comply. Clearly, many firms do not see the impact of not

having regulation. The big impact occurs when one firm complies and when another doesn't have to.

White and Parasher (2007) suggested that environmental regulation can positively influence competitiveness and the Cabinet Office [anon] reported that businesses acknowledged the benefits of regulation. White and Parasher (2007) stated that the most important conditions for providing innovation via regulation is the clarity, ambition and determination of the regulatory authorities to increase pollution prevention requirements and to use a range of instruments to do so, including strict enforcement. The authors' acknowledged that this conclusion goes against some of the current published literature.

The impact of environmental legislation exists at a number of levels; when it is implemented and enforced as well as by virtue of its existence and accumulation. Whether there is a significant impact from legislation depends on the effort made to comply.

Implementation

The effective implementation of environmental legislation is crucial to minimising the negative impact(s) that can occur from environmental legislation. Ambler and Chittenden (2009) compared the UK and EU regulatory systems, finding them to be worlds apart with no effective communication between them. They also reported that Members of Parliament (MPs) are failing to curb the flow of new regulation as a result. In a review of 246 Regulatory Impact Assessments (RIA), the authors argued that the UK's formal consideration of proposed European law arrives too late to amend the legislation prior to its enactment. The authors also suggested that there is no visible benefit from the EU Parliamentary Scrutiny Committee, resulting in a substantial cost to businesses. Moreover, UK-only regulation requires a far stronger challenge from MPs who often rubber-stamp regulation without asking why the UK needs the regulation when the rest of Europe does not.

Gunningham and Kagan (2005) suggested that although the Government promulgates regulation, it is industry that has to devise ways of complying with it and this determines how effective it is. The authors' reported that out of a survey of over 200 firms, the majority had no knowledge of sanctions imposed on them. If businesses aren't aware of the legislation then how can it have a significant impact? However, it is also likely that because of the perceived effort required to comply, some SMEs simply ignored or didn't seek to comply.

The authors' also explained that businesses seeking compliance respond differently to legislation, with some exceeding requirements and others falling short. This shows inconsistency in how SMEs manage compliance. Although the authors' suggested that a culture of compliance is needed so that businesses aim to comply (rather than respond to enforcement action), there is also evidence to suggest that the legislation could be clearer with 'compliance' being more transparent.

Existence and accumulation of legislation

The existence of legislation can be regarded as a burden in itself. The UK is often regarded as over-regulated, causing significant problems for SMEs (Ehmann, 2007 and Hampton, 2005). Many feel that we are now over-regulated to the point where it is impossible to police the regulations effectively. Mandelkern (2001) make the point that the proliferation of regulation has made it impossible for both ordinary citizens and the legal profession to gain an understanding

and practical knowledge of all the rules of law that affect them. However, this burden can be overstated as in many cases SMEs are not actually aware of the legislation; is this because there is too much to comprehend or are SMEs generally oblivious because there are few consequences?

How companies respond to impending regulations is an important aspect of corporate strategy. Clement *et al.*, (2008) examined the direct relationship between size and the choice of strategic response level as viewed by regulators. Their results showed that larger firms generally favour more passive strategies; this may be due to their willingness to use their slack resources; larger firms simply have the capability to comply. In fact, a study by Baylis *et al.*, (1998) provides an example of the differences between the numbers of external pressures on SMEs and large companies. Although SMEs cited regulation as being the most common source of environmental motivation, their response (65%) was lower than larger companies (86%). The main reasons for this were that SMEs are less likely than large companies to operate the 'dirtier' processes that are subject to permit-based regulation. Furthermore, even when permit-based regulation relates to their processes, SMEs may still operate below the thresholds that some statutory instruments allow for exemption (only 26% of SME respondents were subject to permit-based regulation compared to 75% of large companies).

Few SMEs appear to have a good understanding of legislation. Research suggests that a significant minority of SMEs assume that regulation will force them to make environmental improvements even though they have little knowledge of what legislation applies to them or any experience of regulation in practice. Some SMEs also have difficulty in distinguishing between health and safety legislation/ regulators and environmental legislation/ regulators. Indeed, their experience with the way health and safety legislation is implemented leads them to assume that environmental legislation is or will be implemented in the same way. This point is emphasised by the way the recent Government Anderson Review (2008) of legislative guidance classified many 'environmental' issues under a 'health and safety' banner.

Citing an example from the regulation of radioactivity in scrap metal, Baylis *et al.*, (1998) referred to the use of exclusions for small firms and how this allowed them to attempt more active levels of strategic response. These findings somewhat conflict with what is found in the UK – smaller firms are not as proactive as this study suggests and the more support they are given the less they help themselves. Sometimes this kind of support isn't especially helpful as it can result in SMEs having to have a detailed knowledge of the regulation to be aware of the exclusions for small businesses (e.g. exclusions in The Hazardous Waste [England and Wales] Regulations 2005 relating to requirements for 'premises' to be registered). Baldwin (2004) suggested that a lot more is needed from the better regulation agenda for these changes to have an impact on SMEs as well as some of the current initiatives, such as RIAs not going far enough. He even suggested that the burden has increased, for instance, he reported that small firms have 35% higher compliance costs than larger firms (presuming that they comply in the same way) and suggested that they cannot continue to absorb the ever increasing number of regulations that emanate from Europe and Westminster.

Baldwin (2004) also reported that four out of five SMEs thought that burdens are excessive. He argued that small firms are less resilient than large firms to regulatory changes; they have to carry out their own administration and do not have the capacity to employ regulatory specialists. Hence, compliance-related work diverts the attention of key managers away from normal business activities. As a consequence, small firms are dependent on regulators for assistance in interpreting obligations; regulators see small firms as elusive and hard to help. Baldwin's (2004)

opinion was that small firms have particular difficulties with goal-based regulation compared to large businesses who welcome the flexibility.

This review clearly reveals that even though the better regulation movement has produced a large number of initiatives, it has yet to deliver the better regulation that government and small businesses desire.

Enforcement

Enforcement can be considered from a number of perspectives (some of which have been considered previously), for instance, it was suggested by Fairman and Yapp (2005b) Hutter (1997) and Wilson *et al.*, (2011) that SMEs view compliance based on negotiations with the regulator rather than aiming to meet the legislation. This is significant as it suggests that for many SMEs the direct impact of legislation is minimal with any impact being based on whether or not they are subject to regulatory inspection. Due to the level of inspection falling (Bell and McGillivray, 2006 and Ends, 2003), the actual impact of enforcement on SMEs may not be significant.

There are conflicting views as to whether more or less inspection is effective; Fairman and Yapp (2005) and Alexopoulou (2007) suggest that it is, whereas other research suggests that there is no empirical link (Sniffer, 2008b and 2009). Using the example of The Packaging (Essential Requirements) Regulations 2003, the DTI (2003) reported that the standards do not enable national enforcement authorities to assess clearly and indisputably whether a particular packaging item fulfils the 'essential requirements'. This is demonstrated by a lack of enforcement; a mere 6 prosecutions since their introduction in 1998. The report highlighted that it is difficult to distinguish between the impact of the regulations and changes that would have resulted anyway through commercial pressures e.g. lightweighting of packaging is not new. The Industry Council for Packaging and the Environment (INCPEN) reported that yoghurt pots are 60% lighter than 30 years ago; plastic soft drink bottles are one-third lighter than when first introduced 30 years ago; plastic carrier bags are half as thick as 20 years ago; and drinks cartons are 16% lighter than 10 years ago (DTI, 2003).

The DTI (2003) report was based on research with large companies, with 18 of the 22 respondents saying that application of the procedures had resulted in changes to their packaging. The companies reported that enforcement of the essential requirements has encouraged discussions between the enforcement authorities and companies producing or distributing packaged goods. However, once an enforcement procedure is in place to stimulate company action, the regulations are largely self-policing. Thus if sufficient pressure is not being applied to the supply chain (i.e. where no big company is involved), awareness of the issues will not spread and compliance does not become part of customers' commercial requirements. The report concluded that an enforcement regime needs to be in place for the system to work.

The Effectiveness of Legislation in achieving Environmental Protection

For environmental legislation to be effective it must provide a higher level of environmental protection. The EA recognise this in its Compliance Classification Scheme (CCS) which classifies the level of risk, based on its potential impact on the environment (although environmental damage does not necessarily have to occur). This runs in parallel with the EA Common Incident Classification Scheme (CICS), which classifies incidents against actual environmental impact. The judgement of 'risk' is crucial as it dictates the level of enforcement

imposed by regulatory authorities. If there is no link between compliance and environmental protection then key areas of the law will (do) not need to be enforced and thus this needs to be corrected at Government policy level. However, if there is a link and the assessment of risk does not identify it, then it is likely that significant areas of legislation are not being enforced and that environmental harm is prevailing insidiously.

Remas (2006) concluded that there is some evidence that improved on-site environmental management leads to lower average emissions (although not necessarily a compliance issue). However, the strength of the evidence differs significantly between receiving media, regions of Europe and different sectors.

Cheesbrough and Knuckey (2004) provided strong evidence showing that improved environmental management had an impact on the number of self-recorded permit/ licence breaches. The impact may be observed both positively (i.e. reducing the number), or negatively (i.e. increasing the number).

The mix of positive and negative impacts for the compliance indicators demonstrates that improved on-site environmental management results both in a reduction in 'non-compliances' (such as permit breaches) and in an improvement in the detection and reporting of incidents. Where the scale of the first impact outweighs the second, the overall impact on the compliance indicator is positive. Where the reverse is true, the impact is negative (Cheesbrough and Knuckey, 2004). These results are broadly supported by Alexopoulou (2007).

Whether environmental legislation has a significant impact on environmental protection is critical from a policy point of view. Thus it is a key area that needs to be researched in order that businesses take their responsibilities seriously and that the environmental regulators' enforce the legislation effectively. Adshead (2008) stressed that regulation can only be effective to the extent that it is complied with and thus leads to the assumption that measuring the link between environmental legislation and environmental protection must be accompanied by a clear understanding of the level of compliance.

Methodology

Semi-structured interviews were conducted with SME management, site staff, regulators, policy makers and support organisations. Interviewing was regarded as the most appropriate data collection method as prior research has shown this to be effective for studying hard-to-reach small businesses (Appleyard *et al.*, 2004).

A pre-written prompt sheet provided an interview framework. Discussions were allowed to flow, giving respondents freedom to discuss relevant issues in detail whilst ensuring the same topics were discussed in each interview (as in Fairman and Yapp, 2005). The interview protocol was piloted, recorded and transcribed as well as compared with on-site compliance audits to ensure triangulation. Interview responses were logged by subject heading and grouped into common responses; quotes which reflected the overall response were chosen. The approach used is further described in Wilson *et al.*, (2008b) and is supported by Fink (2003), Berg (2004), Holbrook *et al.*, (2003) and Appleyard *et al.*, (2004).

Interviews were conducted between April 2008-March 2009 with a total of 44 SME managers and 34 site staff; interviews lasted sixty and twenty minutes respectively. Interviews were also

conducted with 2 EA managers and 1 inspector, 1 United Utilities (UU) inspector, 1 National Measurement Office (NMO) manager, 2 trading standards (TS) officers, 4 Local Authority (LA) officers, 4 Defra policy writers and 6 SME/ LA support organisations, including: the Chamber of Commerce (CoC), The Local Better Regulation Office (LBRO), Business Link, The Federation of Small Businesses (FSB) and The Local Authorities Coordinators of Regulatory Services (LACORS).

In total, 44 SMEs from the north-west of England were studied between April-September 2008; including 20 waste management SMEs, 5 hoteliers, 3 printers, 11 manufacturers and 5 construction businesses. Fewer site staff were interviewed than managers because it was more difficult to get the opportunity to discuss issues, due to a lack of availability or job relevancy.

The interviews were supported with compliance audit data presented in Wilson *et al.*, (2007, 2009, 2010 and 2011 [in-press]) and Wilson and Williams (2008).

Results

The characteristics of the SMEs studied are detailed in Tables 4.28-4.33. Analysis shows that:

- The vast majority of management (93%) and site staff interviewees (97%) were between the ages of 25-64 (Table 4.28).
- Almost 82% of SMEs employed up to 49 staff showing that the vast majority of SMEs were in the 'small' to 'micro' category (Table 4.29).
- Sixty-four percent of SMEs had a turnover of between £0-2m, with the remaining being shared between businesses with a turnover of between £2-5m and £5-20m (Table 4.30).
- Forty-one percent of SMEs were established >10 years and 36% had been established between 2-10 years (Table 4.31).
- Ninety-five percent of SME management and 65% of site staff had Internet access (Table 4.32).
- Fifty-five percent of SME management and 35% of site staff had some prior environmental experience (Table 4.33).

The interviews focused on: 1) the impact of environmental legislation, 2) the effectiveness of environmental legislation and 3) the link between compliance and environmental protection.

The impact of environmental legislation

This was assessed by investigating how legislation is implemented and interpreted, its effect on operations and behaviour and the assistance and guidance provided by regulatory authorities. SMEs were also asked for their recommendations for improvement. The 'impact' of environmental legislation was interpreted broadly and was taken to include: direct compliance costs, time, training costs, risk and uncertainty (as in Appleyard *et al.*, 2004).

When asked: "*How well, in your opinion is environmental legislation implemented by the government?*" over half of managers stated that they "*don't know*". When probed, they didn't know because they didn't have any experience of the legislation, suggesting that implementation hasn't been effective. Other responses said it was "*poor*" or that the "*Government don't understand the issues for small businesses*". Those SMEs with some

awareness said that they had to go out looking for the information – *“nothing gets directly sent to us”*. There were no specific conclusions to draw between different SME sectors or sizes.

The EA stated that it provides support to SMEs via seminars, online guidance and via its customer contact centre; other regulations provided similar levels of support, although there was less well developed support from LA and none from TS. Defra stated that it left it to the enforcement authorities to implement and enforce the law once it had approved the legislation and associated guidance. This caused problems, as SMEs did not go to the regulator, instead relying on trade associations and industry contacts for information. Support organisations didn't focus much of their support on the implementation of environmental legislation and seemed to concentrate their resources on other business areas such as employment law and health and safety.

When asked: *“Did you find the legislation affecting the organisation easy to understand when first introduced/ when you joined the company/ or when realising you had to comply?”* the majority of managers said *“no”*, with only a small number (<10%) saying *“ok”*. A significant number said they *“don't know”*, because they either didn't have any initial understanding of the requirements or didn't know there were any requirements. This was supported by the regulators and Government officials who recognised the complicated nature of some legislation (although each individual organisation thought its guidance was clear) and by site staff, with only 1 interviewee stating that they found The RoHS Regulations straightforward; the remaining interviewees said that they found the legislation confusing with the guidance needing to be better (the view from the NMO was that the regulations were extremely clear). A high percentage admitted that they didn't look at legislation; this opinion was particularly high from the waste sector. On analysis of all responses, the overall impression was that there was no system in place for identifying applicable legislation and/ or responding to requirements.

When asked: *“From the legislation previously discussed: -*

- (a) what impact have these had on the organisation (i.e. direct costs or non-monetary impacts)?*
- (b) have your operations changed as a result?*
- (c) has your behaviour changed as a result?”...*

...overall, SMEs were undecided, with half saying that there was an impact and half saying there wasn't. There was confusion from some SMEs who automatically thought there was an impact even though they couldn't cite relevant examples. The effectiveness of this question was limited due to SMEs' poor understanding of legislation, coupled with the perception that compliance is seen as bureaucratic. Four SMEs mentioned and were able to discuss specific impacts as a result of The Hazardous Waste, RoHS and WEEE Regulations and one SME confirmed that the legislation had forced them to look at their processes and clean up their sites. Managers from waste SMEs tended to think that the regulations had less of an impact than the other SME managers; this may be indicative of this sector which is often portrayed as more uncontrolled, even though it is 'directly' regulated by the EA.

Site staff responses varied depending on the individual's level of awareness and role within the organisation. Some individuals referred to the impact from The RoHS Regulations, whilst others thought there was an impact but weren't sure what this was. Seventy percent of interviewees from waste SMEs said they *“didn't know”* what impact the legislation had with only those staff with some management or supervisory function having awareness of direct requirements. Similarly, few were able to cite specific instances when legislation changed operations or

behaviours. Those with some knowledge referred to requirements for bunding of hazardous substances and maintenance requirements.

Government officials were unclear as to the impact of different legislation, particularly as formal reviews had not been conducted. Regulators thought that there were impacts from some legislation but this varied in terms of changes in behaviour and from a financial and administrative impact. The EA, NMO and UU interviewees confirmed that the impact was higher where proactive enforcement work had been conducted. TS admitted that the impact of The Essential Requirements Regulations had been minimal as it just didn't have the resources to police or promote the legislation.

The question: *"Do you think the 'transitional periods' (check understanding) are long enough from when the legislation is written to when you have to comply?"*, was answered with a high percentage of *"don't know"*. Those that were aware stated that they are only helpful if there is interaction between the Government, regulator and SME during the transitional period. One SME manager reported that the transitional periods were pointless, as people won't take any notice until the last minute; this view was shared by the EA enforcement officer, although the use of common commencement dates was supported (i.e. April and October). There were no specific conclusions to draw between different SME sectors or sizes.

When asked *"How do you rate the assistance and guidance provided when new legislation is introduced/ or when legislation is new to the individual?"*, 79% of respondents thought it was *"poor"* or *"they didn't get much"*, with only 16% saying that guidance was *"ok"*; the remaining reported that they *"didn't know"*. Only those from the manufacturing or waste sectors said that guidance was ok, which perhaps reflects the more regular contact for these sectors.

Those responsible for the guidance said that it was good even though it varied between regulators. There was also an appreciation that the legislation was complex which inevitably made it difficult to interpret into simple guidance. The EA confirmed that it wasn't really exposed to a lot of the guidance provided, but it felt it could be improved as a result of direct feedback from SMEs. Clearly, there may be ways of improving the guidance, but the bigger issue as expressed by the NMO is penetrating SMEs so that they actually use the guidance provided.

When asked *"How could implementation be made easier (nationally or on own site)?"*, there were a wide range of responses. Fifty-three percent of respondents said they would like more face-to-face support; responses came from all 5 sectors interviewed, although the hotel and construction sectors requested this less than the other sectors. Other popular responses included: more financial help for training and incentives to be more environmentally friendly (25%), better guidance (15%) and clearer legislation (8%).

The EA enforcement officer stated that an improvement would be to modify the way it is promoted, stating that *"few businesses actually know what we do"*. From the interviews it wasn't clear how much regulators' interact – each seemed to keep to their own remit (via memorandums of understanding) which again limits their understanding of the total impact of compliance on SMEs. The regulators also felt that they need more warning from Government when new legislation is to be implemented, particularly as they have to inform staff/ industry and prepare guidance.

The effectiveness of environmental legislation

This was assessed by investigating the amount of enforcement action/ regulatory contact, awareness of non-compliance and opinion on enforcement.

Only 1 SME confirmed that it had ever been prosecuted; a water pollution incident in one of the waste SMEs. In general, this information was corroborated by the site staff interviewed. Those that answered “no” were asked if “*they ever identified any issues which they had to act on*”. Only one of the SMEs not routinely inspected by the EA confirmed that any environmental compliance issues had ever been identified; identifying the need to register a waste exemption for the use of a baler. Contact from other regulators was equally as low. In contrast, of the 20 directly regulated SMEs, 19 had issues raised in inspections; however, these didn’t necessarily correlate with the range and severity of issues identified in the compliance audits (Wilson *et al.*, 2007, 2009, 2010 and 2011 [in-press]) and Wilson and Williams, 2008).

When asked, “*Are you aware of any current environmental non-compliance within the organisation?*” only 4 (2 waste, 1 manufacturing and 1 construction) SMEs identified any issues. Two admitted that they “*didn’t know*”, however the remaining 38 SME managers (88%) weren’t aware of any non-compliances. Those aware, referred to a ‘duty of care’ issue, two ‘oil storage’ issues, one failure to register for ‘packaging producer responsibility obligations’ and one reference to exceeding waste storage limits. One site staff interviewee referred to the mixing of hazardous and non-hazardous waste as an issue and site staff from SMEs were generally aware that the “*agency*” (EA) visited the site. They only considered non-compliances to be an issue if they were raised by the EA and only serious if prosecuted.

The interviewee responses did not closely correlate with the compliance audits conducted (Wilson *et al.*, 2007, 2009, 2010 and 2011 [in-press]) and Wilson and Williams, 2008). This corroborates previous assumptions that SME awareness of environmental legislation is poor; more worryingly, it shows that SMEs lack the initial knowledge to be able to identify and improve their compliance. Those waste SMEs subject to periodic inspection thought that the EA would identify all issues and therefore made little attempt to manage their own compliance; placing more emphasis on inspection. This indicates that the concept of ‘risk’ can not be treated statically, with the strategies used to manage risk, needing to be flexible. The EA officer’s view of risk related to how the site operated rather than what they did as a business; this view is supported by Wilson *et al.*, (2008), but does not seem to be embedded in regulators’ inspection and enforcement strategies.

When asked, “*What is your overall perception of how environmental regulation is enforced in the UK?*”, the majority (75%) of the non-waste SMEs said that they had “*no opinion*” as they had no regulatory contact or experience . One respondent stated that “*we’ve not had any dealings, no one comes to us and we’re not going to go to them*”. Although these results are not conclusive, it demonstrates the lack of regulatory contact a typical small business receives. Of the remaining respondents, 5 had negative opinions stating that enforcement was “*poor*”, particularly as this resulted in non-compliant businesses getting away with things. Only one respondent felt that there was a lot of enforcement and prosecutions.

Waste SMEs considered all regulatory contact to be ‘enforcement’ and thus referred to various issues that had been picked up during inspections. When non-environmental permitting issues were discussed, the interviewees explained that there was no focus on them with inspections focusing on permit conditions.

The EA officer commented that 'inspection' was an important enforcement mechanism, with the move towards less inspection likely to result in a negative impact on compliance. The EA officer commented that inspection helps to reduce non-compliance and "*not finding*" anything does not mean a wasted visit. Other regulators appreciated this view but were concerned by the lack of resources allowing them to conduct face-to-face inspections.

Apart from waste SMEs, few had enough regulator contact to be able to say "*How effectively they felt environmental non-compliances in their organisation have been enforced*". By this stage of the interview, interviewees were more aware of some of the compliance issues that may exist in their businesses and thus some recognised that because they were non-compliant then these issues were not well enforced. Although waste SMEs explained that they had been informed of various issues, there was not a lot of enforcement. When site staff were asked a similar question, only the waste site staff were able to explain that site visits were conducted; no other site staff were aware of any activity.

When asked, "*How often are you inspected for environmental compliance?*", apart from the waste SMEs who all confirmed that they had been subject to inspection, only 2 of the remaining 24 SMEs confirmed that they had been visited/ contacted. These were both from the manufacturing sector but appeared to be random as they occurred once in 8 years.

The LAs interviewed recognised that environmental law is extremely complicated and that the amount of enforcement was limited, although they did target fly-tipping hot spots. Because SMEs have to comply with a wide range of legislation and regulators, which can be overwhelming; this was demonstrated by a lack of holistic knowledge of some of the topics discussed with regulators and support organisations.

When asked, "*What do you think of these inspections?*", those manufacturing businesses inspected did not find the visits particularly helpful as they were very brief and the particular officers did not solve the issues raised. The views from the waste industry were mixed, as 13 out of 20 respondents said they were "*fine*" or "*useful*", the remaining respondents said that they didn't get any direct benefit. Overall, it is important to be cautious about the respondents' apparent "negativity" as some of the managers had negative views about all regulators and/ or they were unhappy that issues had been picked up.

SMEs had little opinion of the environmental regulators due to the lack of contact. Those from the waste industry again had mixed views, with 9 saying they the regulators "*ok*" or "*helpful*", 3 didn't wish to express an opinion and 8 said that they "*didn't find either helpful*".

When asked, "*Do you have any experience of different enforcement action as a result of different types of non-compliance detected?*", similarly, there was little experience to draw on. However, there were examples of inconsistencies. Twelve of the waste SMEs stated that some issues were raised in one inspection then forgotten about by the next. There didn't appear to be any obvious sampling of environmental permit conditions or evidence that non-permitting legislation was specifically assessed – one SME manager stated that "*different inspections focused on different issues and were more stringent in some cases than others*".

Compliance and environmental protection

This was assessed by investigating SMEs' opinions of their environmental impact(s), the link between compliance and environmental protection and how to achieve greater protection for the environment.

When asked, "*What activities does the organisation undertake which you think have an impact on the environment (including positive or negative impacts)*", 24 of the 44 identified their operations as having a negative impact, common answers included: "*waste*", "*use of energy*", "*transport*" and "*effluent*". However, 19 SME managers thought they didn't have any impact with 2 SMEs (reducing to 1 when prompted) stating they had a positive impact because of the recycling they did.

Site staff referred to "*vehicle emissions*" and "*waste*" as examples; however, the majority said that they didn't think there was any direct impact. Not surprisingly, those from manufacturing businesses identified more impacts than those from less hazardous sectors, like hotels. Despite this, 8 of the 20 waste SMEs did not think their businesses had a negative impact, primarily because of the perception that they were processing waste and avoiding landfill.

It's clear from the discussions with management and site staff that there is confusion as to what is meant by 'environmental impact', with some seeing themselves as being fairly innocuous, with others seeing their activities as having a positive impact, presumably because if they weren't in operation something more damaging would happen.

When asked, "*Do you think that the environmental legislation affecting the organisation has been successful in terms of achieving environmental protection*" the responses were mixed with 18 SMEs saying they "*didn't know*" or didn't have an opinion. The remaining respondents were divided with 13 saying that some legislation had helped to achieve environmental protection and 13 saying that it hadn't. A key reason cited for why some legislation hadn't been successful was because of a lack of enforcement. Moreover, those replying with positive answers also cited "*more policing/ enforcement*" as the way to get drive higher levels of environmental protection. Despite SMEs not wishing to be exposed to higher levels of enforcement, both negative and positive opinions cited a lack of enforcement as the key issue. Whilst no one wants to see regular prosecutions for very minor offences there was a feeling that the legislation will be taken more seriously if effectively policed.

Site staff were "*not sure*". One respondent asked where you would draw the line in terms of ensuring environmental protection but the general feeling was that there wasn't a problem – respondents only felt there was an issue if it was identified by the regulator and only "*serious*" if prosecuted.

SMEs were asked if the efforts required to comply were comparable to the pollution threat of the organisation's activities. Only 6 of the 44 SMEs responded positively, 23 said "*no*" and the 15 remaining SMEs gave a neutral answer or said they "*didn't know*". Some SMEs questioned the 'benefit' of having a premises code under The Hazardous Waste Regulations, with others stating that there was a lot of complex legislation and that additional paperwork doesn't really protect the environment. There were no additional comments from site staff, nor were there any differences between sectors.

When asked if more stringent regulations would result in better protection for the environment, only 7 SMEs agreed. Moreover, those SMEs caveated their opinion by saying that more stringent legislation may come at a cost if it imposes too many requirements. In addition, one respondent said *“the more difficult the legislation is to meet the more chance there is that people will break it”*. The majority of the remaining respondents didn't agree that more stringent legislation would result in better protection for the environment, feeling that resources should be put into monitoring and providing advice. There were no additional comments from site staff, nor were there any differences between sectors.

Discussion

Impact of Environmental Legislation

Implementation

The implementation of environmental legislation has not been effective; SMEs reported that they had to *“go out looking”* for information. Despite regulators providing the most environmental support, SMEs did not go to them for information. They preferred to go to 'support organisations', even though the 'environment' was not well resourced by these organisations. A reason for this may be because of the short length of time some environmental legislation has been in place. Research on behalf of the Cabinet Office (anon) suggested that other legislation, such as employment law, VAT and Income Tax/ Corporation Tax has become an accepted part of the modern business environment and thus through familiarity, become accepted.

SMEs did not find environmental legislation easy to understand. This is accepted by regulators and Government officials who recognised the complicated nature of some legislation. SMEs had no system in place for identifying applicable legislation and/ or responding to requirements. This is supported by Taylor/ You Gov (2007), Atkins (2007) and the Cabinet Office (anon), the latter of which identified environmental regulations as a particular concern.

SMEs' opinions were mixed and Governmental opinion was undecided as to the impact(s) of environmental legislation (on SMEs). The regulators interviewed agreed but stated that the impact increased with enforcement action. Although some SMEs felt that regulation is a burden, few were able to cite examples of areas that were burdensome. This suggests that the impact(s) of legislation on SMEs may be overstated; it can only be an impact if businesses comply. This study suggests that regulation is considered inherently negative by businesses despite not always having a negative experience.

SMEs viewed compliance support as poor. As expected, the opposite was reported by the authors of the guidance, although there was appreciation that the legislation was complex (as supported by Wilson *et al.*, 2010 and 2011) and as such it was very difficult to write clear, concise, yet comprehensive guidance. SMEs favoured face-to-face support; supporting SMEs needs to be a 'contact sport' (direct face-to-face contact is supported by Alexopoulou, 2007, Howarth and Fredericks, 2011, Williamson *et al.*, 2006, Fairman and Yapp, 2005). This produces a predicament as direct support is time-consuming and therefore costly. Are costly interventions that work, better than cheap ones that don't?

Tilley (1999) in particular highlights that there is evidence that support for more extensive environmental education and training programmes and a much stronger regulatory framework

would help to counteract the imbalance between small firms' attitudes and behaviours. Other support preferences included financial help for training as well as better guidance. The regulatory officer identified the self-promotion of the regulators as a key area of improvement for the EA. Different regulators seem to keep to their own remit, although the size of the 'environment' as a discipline was recognised.

Enforcement action as a result of non-compliance

Enforcement action on the SMEs audited was low, with only one SME reporting being prosecuted and one SME (not routinely inspected by the EA) reporting having any compliance issues identified. Compliance issues were identified in 19 of the 20 waste SMEs, this did not necessarily correlate with the compliance issues identified in the independent environmental audits (Wilson *et al.*, 2007, 2009, 2010, 2011 (in-press), Bland *et al.*, 2004 and Fairman and Yapp, 2005).

SMEs were seemingly unaware of compliance issues in their business; only four could name any issues. It appears that SMEs only consider non-compliances to be an issue if raised by a regulator and only 'serious' if prosecuted. SMEs appeared to lack the knowledge to be able to identify and improve their own compliance and those SMEs subject to regulatory inspections placed a lot of onus on the EA identifying issues. A reason for the high levels of non-compliance could be a perception that competitive advantage could be gained from non-compliance, which is generally easier on a smaller scale (as in Appleyard *et al.*, 2004).

SMEs reported little experience of enforcement – primarily due to a lack of contact from regulators (as supported by Sniffer, 2010). Some SMEs even suggested that enforcement was poor despite not wanting to increase their risk of enforcement. This is made worse because SMEs regarded all regulatory contact as 'enforcement'.

This study suggests that the concept of 'risk' is not static and can not be defined for SMEs as a collective (management of 'hazards' at an individual SME level dictates the level of risk). Consequently, the strategies used to manage risk need to be regularly reviewed and updated. This has implications for how compliance is managed, especially with the continued reductions in regulatory inspections – as supported by Bell and McGillivray, 2006 and Ends, 2003; only 2 of the 24 non-waste SMEs in this study had been visited/ contacted (moreover, this contact appeared to be random). Regulators recognised the benefit of inspection, feeling that it provides an important check as well as letting SMEs know that they exist. However, there are resource issues. The need for a stronger regulatory framework is supported by Tilley (1999) and Baylis *et al.*, (1998). Merritt (1998) comments that market forces have yet to significantly impact SMEs behaviour and thus, suggests that 'regulation' is crucial to bridging the gap.

It was difficult to determine the effectiveness of inspections based on SMEs' perceptions/ opinions as many SMEs had negative views of regulators. This was not helped by the inconsistent nature of inspections, with few subject to inspection. Twelve SMEs reported that issues had been raised in some inspections then forgotten about by the next inspection. This was made worse because there was no obvious sampling of environmental permitting conditions or of other non-environmental permitting legislation.

Effectiveness of Environmental Legislation

Compliance and environmental protection

Many SME managers and site staff were not able to identify their environmental impacts (also reported by Atkins, 2007). There was confusion as to what 'environmental impact' amounted to, with some seeing their business as fairly neutral, or even having a positive impact; presumably because if not in operation something more damaging would happen. Petts *et al.*, (1999) found that despite the 'environment' and 'compliance' being important to individuals, this positive culture differs from the operational climate that SMEs find themselves in (i.e. they lack the capacity to act). This is also supported by Merritt (1998) and Tilley (2000), the former of which acknowledge that although most managers have concern for the 'environment', they have little environmental knowledge and have not introduced formal practices to manage the environmental performance of their business.

SMEs had mixed views on whether environmental legislation is successful in achieving environmental protection. Their lack of belief in the successfulness of environmental legislation is not necessarily an indication that SMEs did not 'believe' in the legislation, rather an indication of the lack of awareness of the law and its aims. A key reason cited for both those in support as well as those in opposition was a lack of enforcement; a view acknowledged by Bland *et al.*, (2004), Benson *et al.*, (2006), and Wilson and Williams (2008). Regulators clearly had a better understanding of the benefits of the legislation and were generally more convinced of the merits. However, the extent of their knowledge was limited to the regulations they policed and in the case of the EA and LA where several regulations were enforced, non-permitting legislation was much less of a priority.

Over half of SMEs did not think that the effort to comply was comparable to the organisation's pollution threat. Some SMEs questioned the purpose of the 'premise's code' in The Hazardous Waste Regulations, with others stating that there was a lot of complex legislation and that additional paperwork doesn't really protect the environment. This view was expected from SMEs as many saw regulation in general as unnecessary. As expected, a minority of SMEs thought that more legislation would result in better protection for the environment. Moreover, those SMEs caveated their opinion by saying that more stringent legislation may come at a cost if it imposes too many requirements on businesses. Government policy makers preferred there to be better communication and enforcement of environmental legislation and although not stated, regulators implied that more resource would enable them to do a more thorough job.

Conclusions and Recommendations

It is clear from this study that a large amount of SMEs don't understand anything about environmental compliance and none understood everything. Moreover, SMEs do not understand their environmental responsibilities completely and what they do understand they haven't understood for long. In many respects, this conclusion can be extended to regulators, policy writers and support organisations as a holistic awareness of environmental legislation was not demonstrated.

The following specific conclusions have been made:

- SMEs did not feel that the implementation of environmental legislation was effective. Extensive support was provided by the regulators, but SMEs preferred to use other sources.
- SMEs and in particular LAs did not find environmental legislation easy to understand.
- SMEs' opinions were mixed on the impact of environmental legislation, although few were able to cite specific negative examples. Regulators stated that the impact increased commensurate with enforcement.
- SMEs thought the guidance provided with new environmental legislation was poor. SME market penetration was identified as a key barrier.
- SMEs cannot be considered a homogenous group. Different strategies are needed for different sized SMEs.
- Whilst online support may be adequate for larger SMEs, 'micro' and 'small' businesses need direct support. The EA acknowledged that its promotion could be improved; other regulators tended to keep to their remits.
- Enforcement action was low; only 1 of 44 SMEs had ever been prosecuted. Of the SMEs not routinely inspected, only 1 had any environmental issues identified, with a second visited. Almost all waste SMEs had issues identified in inspections, although these didn't correlate with compliance audit data.
- SMEs were unaware of compliance issues. Non-compliance was only an issue if raised by a regulator and only serious if prosecuted.
- Due to a lack of contact, the majority of SMEs had no opinion or a negative opinion of how environmental legislation was enforced.
- The effectiveness of environmental legislation could not be assessed. A limited number of SMEs were subject to inspection; those inspected were often biased against them.
- Not all SMEs were aware of the environmental impacts of their operations.
- SMEs did not consider the efforts required to comply to be comparable with the pollution threat of their activities. This was despite SMEs having poor knowledge of what constituted 'compliance'.
- SMEs did not think more legislation would result in better protection for the environment. Policy writers preferred more enforcement and regulators more resources.
- Inspection was inconsistent between SMEs. Where frequent visits were made they were uncoordinated with little reference to previous visits.
- SMEs need to take more responsibility for applicable legislation; other issues are used as an excuse to negate non-compliance.
- Regulators, SME support organisations and policy writers do not have sufficient awareness of the issues facing SMEs. They consider 'SMEs' to be much smaller than the definition allows.
- The impact of environmental legislation on SMEs varies; it is a consequence of 'effort to comply' and 'enforcement pressure'.
- SMEs prefer prescriptive requirements. Comparison can be made with the non-prescriptive requirements of environmental management systems which have not been widely implemented by small SMEs.
- There is such a significant amount of environmental legislation that it requires several Government departments, regulators, SME support organisations and specialist consultants to administer; SMEs are expected to meet all applicable legislation, which can impose a significant cumulative burden.

The following recommendations have been made:

- The definition of an SME should be reclassified with 'small' and 'micro' sized organisations (i.e. <50 employees) separated from 'medium' sized businesses (i.e. >50 employees). 'Small' and 'micro' businesses are distinctly different from 'medium' sized organisations and thus 'compliance support' needs to be more directly focused where it is needed.
- Inspections and audits need to remain a key part of regulators' enforcement strategies. Frequency should be dictated by how well environmental risk is managed rather than by environmental hazard.
- Inspection format needs to be more carefully managed. If inspection frequency is to reduce, they need to be co-ordinated within a defined 'compliance' period to cover all permit conditions and other applicable environmental legislation; making them comprehensive and making them count.

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Tables**Table 4.28 Management and site staff interviewee age/ sector comparison**

Age boundaries	18-24	25-44	45-64	65+
Construction	0 (0)	3 (2)	2 (2)	0 (0)
Manufacturing	0 (0)	3 (2)	8 (4)	0 (0)
Hotel	0 (0)	1 (0)	4 (2)	0 (0)
Printing	0 (0)	1 (2)	2 (0)	0 (0)
Waste	2 (1)	12 (14)	5 (5)	1 (0)
TOTAL	2 (1)	20 (20)	21 (13)	1 (0)

Table 4.29 SME size/ sector comparison

Employee no.	0-9	10-49	49-250
Construction	0	3	2
Manufacturing	1	5	5
Hotel	5	0	0
Printing	3	0	0
Waste	9	10	1
TOTAL	18	18	8

Table 4.30 SME turnover/ sector comparison

Turnover (£)	0-2m	2-5m	5-20m
Construction	2	2	1
Manufacturing	4	1	6
Hotel	5	0	0
Printing	3	0	0
Waste	14	5	1
TOTAL	28	8	8

Table 4.31 SME history/ sector comparison

Year Established	<1	1-2	2-5	5-10	>10
Construction	0	0	0	1	4
Manufacturing	0	0	1	0	10
Hotel	0	2	1	1	1
Printing	0	0	0	2	1
Waste	3	5	8	2	2
TOTAL	3	7	10	6	18

Table 4.32 Management and site staff internet access/ sector comparison

Internet Access	Yes	No
Construction	5 (4)	0 (0)
Manufacturing	11 (6)	0 (0)
Hotel	5 (2)	0 (0)
Printing	3 (2)	0 (0)
Waste	18 (8)	2 (12)
TOTAL	42 (22)	2 (12)

Table 4.33 Management and site staff environmental experience/ sector comparison

Experience	Yes	No
Construction	5 (1)	0 (3)
Manufacturing	7 (3)	4 (3)
Hotel	1 (0)	4 (2)
Printing	1 (0)	2 (2)
Waste	10 (8)	10 (12)
TOTAL	24 (12)	20 (22)

Key:

Figures in brackets relate to site staff

Unbracketed figures relate to management

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4.2.9 Wilson, C, D, H; Williams, I, D and Kemp, S (2011)

Evaluating and improving the Environmental Compliance Control Systems for Small and Medium-Sized Enterprises. Environmental Policy and Governance. *In-press*.

The paper incorporates an analysis of the Environment Agency (EA) Operational Risk Appraisal ('Opra')/ Compliance Assessment Report (CAR) system as well as developing environmental compliance performance indicators and an initial assessment methodology for SMEs not directly controlled under environmental permitting.

General and specific compliance and non-compliance performance indicators are suggested along with recommendations to improve SME compliance controls.

This paper refers to the research conducted as part of the author's final PhD submission and forms part of the discussion and conclusions in Chapters 5 and 6.

See below for an edited copy of the paper.

Evaluating and Improving the Environmental Compliance Control System for UK Small and Medium-Sized Enterprises

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Abstract

Whilst the 'environment' is often perceived as a particularly heavily regulated area of business, in reality, directly-regulated businesses represent a small proportion of the business community. Although many European agencies and authorities have regulatory responsibilities, enforcement of environmental legislation is very low and does not correlate with independently assessed levels of compliance. This study aimed to evaluate and subsequently outline potential improvements to compliance controls for small and medium-sized enterprises (SMEs). Forty-four SMEs from the north-west of England were interviewed/ audited between April-September 2008. Using a UK-based system as a case-in-point, the Environment Agency's (EA) Operational Risk Appraisal ('Opra')/Compliance Assessment Report (CAR) system was analysed. Environmental compliance performance indicators and an initial assessment methodology for SMEs not directly controlled under environmental permitting were also developed. The study showed that:

- Compliance with Environmental Permitting legislation was low in many areas; operators were complacent of environmental permit conditions.
- Regulatory authorities are either unable/failing to implement their enforcement policies or unable/failing to identify non-compliances due to the infrequency or limited nature of their inspections.
- The link between the EA Opra/CAR system and the control of 'other' environmental legislation is weak.
- Improvements are needed to the EA Opra/CAR system – control measures are not fully taken into account when calculating risk.

Recommendations to improve SME compliance controls include using internationally applicable general and specific compliance and non-compliance performance indicators, re-designing the Opra system and using an initial assessment methodology based on understanding the hazardousness of SME categories, compliance levels and operator competency.

Introduction

Following Europe's 2010 post-recession austerity measures, it is clear that whilst we need to protect the environment this needs to be done with fewer resources (Defra, 2010, 2010b and Sniffer, 2010). The 'environment' is already recognised as being a particularly heavily regulated area of business, with over 80,000 pages of European legislation (Williamson *et al.*, 2006) and over 500 relevant EU Directives (Ebbage, 2009). In the years since 1997, more environmental legislation has gone through the UK parliament than any other area of law, except that covering finance and justice (Ends, 2008).

SMEs are defined as businesses employing <250 members of staff, having a turnover of <€50 million and/ or an annual balance sheet of <€43 million (European Commission, 2006). They are extremely important to Europe's economy; more than 99% of all European businesses are SMEs, they provide two out of three of the private sector jobs and contribute to more than half of the total value-added created by businesses in the EU (EC, 2010). In the UK they account for 99.7% of the 4.7 million businesses, 47.5% of employment and generate 48.7% of turnover, (Richard, 2008). Although this definition is widely recognised, it includes an extremely broad range of businesses. As a consequence, it is difficult to consider SMEs as a homogenous group.

Regulatory bodies often use risk-based systems to regulate businesses. In England and Wales, the Environmental Permitting system was introduced to simplify permit applications, amendments and variations for businesses and their regulators. The Environmental Permitting Regulations (EPR) was intended to allow regulators to focus resources on medium and high-risk operations whilst continuing to protect the environment and human health. Thus The Environmental Permitting (England and Wales) Regulations 2010 (replacing 2007 Regulations of the same name) have produced a single regulatory framework by streamlining and integrating Waste Management Licensing, Pollution Prevention and Control, Water discharge Consenting, Groundwater Authorisations and Radioactive Substances Regulation. As of 2009; there were 7,974 waste businesses regulated under EPR (EA, 2009) and 2,900 industrial activities for which the Environment Agency (EA) - the primary regulator in England and Wales – has responsibility (EA 2010d). This system, known as Operational Risk Appraisal ('Opra'), is supported by Compliance Assessment Reports (CAR) and is termed "modern regulation" by the EA (2006). However, the system has flaws - those businesses not included in any permitting regime are unlikely to be audited for compliance against any environmental legislation and thus a significant portion go un-inspected (Gunningham, 2002). In fact, regulated and inspected businesses represent a very small proportion of the total UK business community (approximately one quarter of a percent of English and Welsh businesses are regulated by the EA).

Many European regional and local authorities also have regulatory responsibilities; under the UK's Environmental Protection Act 1990, local authorities' regulatory duties typically cover 'less-hazardous' activities. However, Rogers (2007) indicated that local authorities often lacked the resources needed to actively enforce the regulations; resulting in them only being able to respond to complaints. Consequently, the legal compliance and environmental performance of most SMEs remains largely un-quantified. In fact, research shows that SMEs have low levels of awareness and understanding of environmental issues (Taylor/ YouGov, 2007, Atkins, 2007), as well as low levels of compliance with specific legislation (Bland *et al.*, 2004, Fairman and Yapp, 2005, Wilson *et al.*, 2007, 2009, 2010, 2011 [in-press] and Wilson and Williams, 2008).

Enforcement of environmental legislation is generally very low and does not correlate with other independently assessed levels of compliance (see Wilson *et al.*, 2007, 2009, 2010 and 2010b). Statistics from the EA show that in 2008, it prosecuted just 251 companies, with over £3m awarded in fines (an average of £12,014) (EA, 2008b). Although the annual number of fines is consistent, average fines are marginally increasing. Because of the large number of European SMEs, they can have a huge collective impact on the environment even though they may be individually small. Although the risk of pollution is said to be falling (EA, 2008c), the EA has suggested that up to 80% of environmental incidents are caused by SMEs (this is supported by Hillary, 2000, Williamson *et al.*, 2006, Fairman and Yapp, 2005 and Wilson *et al.*, 2010b). However, evidence (EA, 2008c) suggests that regulatory authorities concentrate their efforts (as influenced by a lack of resources) on certain larger organisations (non-SMEs) that they feel they are (only) responsible for and who are perceived to have a higher potential to pollute.

Following the 2008-2010 worldwide economic crisis, budgets will clearly be restricted and resources stretched. Nevertheless, there remains a need to balance meeting financial restrictions whilst continuing to protect the environment.

Purpose of the study

The study builds on and complements findings from previous research conducted by Wilson *et al.*, (2007, 2009, 2010, 2011 [in-press], 2011b [in-press]) and Wilson and Williams (2008). This work is part of a substantial piece of research investigating the legal performance of SMEs with environmental legislation. Using a UK-based system as a case-in-point, this study focused on evaluating and improving the environmental compliance control systems for SMEs. In particular, it:

- Determines the strength of the link between the EA Opra/ CAR system and the control of 'other' environmental legislation in permitted sites¹;
- Develops an initial assessment methodology for SMEs not directly controlled by environmental permitting regimes²; and
- Suggests internationally applicable environmental compliance performance indicators for SMEs.

SME Compliance Control System

The intended goal of environmental regulation is to protect the environment. UK environmental policy has traditionally followed a 'command and control' reactive approach, based on negotiation between industry and Government. This section describes the current system for assessing the compliance of UK businesses with environmental legislation, including the use of risk assessment, local authority controls, environmental management systems (EMS) and compliance auditing.

Risk assessment as a compliance control mechanism

See section 2.6.1 for more information on the subject.

Local authority compliance controls

Local authorities (LA) generally support the use of risk assessment. The process varies between LA but there does not appear to be as formal a process as that set out by the EA (Hampton, 2005). Despite this, many LA have signed up to the Enforcement Concordat, which sets out the principles of good enforcement and the standards expected from enforcement officers. The need for a strong LA enforcement strategy is acknowledged by Defra (2007).

LAs collectively are the country's largest enforcer and thus play a significant role as the UK's biggest single contributor to enforcement spending. The 389 LAs in England had a budget of £807 million for Environmental Health and Trading Standards' Services in 2007, which was considerably more than any other national enforcement agency (Rogers, 2007).

LA services have high levels of contact with businesses (in some areas), even though they are often referred to as 'Cinderella services'. LA regulatory services are responsible for enforcing a total of 61 policy areas and have environmental responsibilities under The Pollution Prevention and Control Act, The Air Quality Regulations, Environment Act, Clean Air Act, Radioactive

¹ This was achieved by auditing permitted sites. It includes an assessment of permit conditions as well as compliance with other regulations. This data was compared with non-permitted sites.

² This considered the current local authority inspection regime for SMEs.

Substances Act, The Packaging (Essential Requirements) Regulations, Environmental Protection Act, Noise and Statutory Nuisance Act, The Noise Act and the Clean Neighbourhoods and Environment Act, Public Health legislation *inter alia*.

Contact varies depending upon the nature of the policy enforced. For instance in 2004/05, 452,000 food hygiene visits were made and 61% of all food premises are visited every year; 242,000 health and safety visits were made in 2004/05, amounting to 20% of all premises (Rogers, 2007). Whilst the overall spend on local authority regulatory services is significant, it is overall a small part of local authority spend. In 2005/06, the overall spend on LA regulatory services accounted for only 0.7% of total Council spending (Rogers, 2007).

Following the Rogers' review, the five enforcement priorities for Trading Standards and Environmental Health services in England are:

- ✎ Air quality, including regulation of pollution from factories and homes.
- ✎ Alcohol, entertainment and late night licensing and its enforcement.
- ✎ Hygiene of businesses, selling, distributing and manufacturing food and the safety and fitness of food in the premises.
- ✎ Improving health in the workplace.
- ✎ Fair trading (trade description/ trade marking/ mis-description/ doorstep selling).

Fairman and Yapp's (2005) study compared LAs that intervened versus those who didn't (from a health and safety perspective). Although the results were not statistically significant due to a low sample size, the study concluded that external intervention by LAs had a positive impact on compliance levels. The study also highlighted that there is empirical evidence to show that enforcement activity is better at achieving compliance with prescriptive requirements than with enforced self-regulatory requirements; interventions such as mail-shots, and leaflets have not been shown to be effective in SMEs. At this stage, it is important to take these results in context as the benefits from an increase in inspection activity is going to be relative to what was there before; as a consequence, the challenge is to be able to set a benchmark level of inspection effectiveness.

Fairman and Yapp (2005) concluded that:

- There are significant differences in the services between LAs in the UK.
- Inspection activity undertaken by an LA significantly affected compliance levels within SMEs.
- Inspection worked relative to other approaches by identifying a 'gap' between existing conditions within the SME and what those conditions should be.
- Face-to-face interventions, discussions and negotiation allow SMEs to internalise the rules.
- Enforcement inspections were effective in improving compliance with prescriptive requirements whilst college placement officer inspections improved compliance with risk assessment.

EMS as a compliance control mechanism

See section 2.6.2 for more information on the subject.

Compliance Auditing

See section 2.6.3 for more information on the subject.

Methodology

The study used triangulation methods to ensure that the results were as accurate as possible. Methodologies included the conducting of compliance audits (as outlined in Wilson *et al.*, 2008) and semi-structured interviews with SME management, site staff, regulators, policy makers and support organisations.

The compliance audits incorporated the use of **regulation-specific** and **environmental offences'** audit templates. The audits were designed to identify both the 'letter' and 'spirit' of the law. The letter of the law was identified by assessing compliance with individual regulatory requirements. The spirit of the law was assessed by judging how SMEs comply with the intentions of the legislation as well as assessing their effort to comply. The compliance audit templates were incorporated into the 3 recognised stages of environmental auditing (i.e. pre-audit fact-find, audit [site visit and document reviews] and post-audit activities) as recommended by Moorman and Kirsch (1991) in order to gain a full picture of individual SME compliance. Although 100% of the regulations were audited, this didn't include 100% of compliance evidence. The environmental offences' audit templates were designed in addition to the regulation-specific audit templates so that where legislation was outcome focused, offences could be determined in addition to where regulations were not met.

Detailed semi-structured interviews were conducted with SME management, site staff, regulators, policy writers and support organisations. The interviews were guided by a pre-written prompt sheet; although discussion was allowed to flow, allowing respondents the freedom to discuss particular relevant issues in detail whilst ensuring the same topics were discussed in each interview (as supported by Fairman and Yapp, 2005). The interview protocol was piloted with all interviews being recorded and transcribed as well as compared with on-site compliance audits. The approach used is further described in Wilson *et al.*, (2008) and is supported by Fink (2003), Berg (2004), Holbrook *et al.*, (2003) and Appleyard *et al.*, (2004).

The 44 management and 34 site staff interviews lasted approximately 60 and 20 minutes, respectively. Interviews of up to 60 minutes were also conducted with 2 EA managers and 1 enforcement officer, 4 LA enforcement officers, 4 Defra policy writers and 6 support organizations, including the Chamber of Commerce (CoC), The Local Better Regulation Office (LBRO) and The Local Authorities Coordinators of Regulatory Services (LACORS). It was felt that the combination of the above triangulation methods helped to ensure the accuracy of the results. In total, 44 SMEs (20 from the waste management industry, 5 hoteliers, 3 printers, 11 manufacturers and 5 construction businesses) were audited from the north-west of England between April-September 2008.

Results

The study assessed the strength of the link between the EA Opra/ CAR system and the control of 'other' environmental legislation in permitted sites. This included an assessment of

compliance with permit conditions as well as an assessment of compliance with 'other' environmental legislation.

EA Opra/ CAR system and the control of 'other' environmental legislation

Compliance with The Environmental Permitting (England and Wales) Regulations (EPR)

These regulations were assessed from a waste perspective only. Some SMEs operated under an old-style licence under the Waste Management Licensing (WML) Regulations and some operated under a new-style standard rules permit under the EPR. In order to assess compliance, conditions were grouped into common categories. Table 4.34 shows how the different requirements of the environmental permits (EP) (formerly known as WML) were met.

All 20 of waste management SMEs were obligated under the regulations. A further 8 SMEs were required to comply with registerable exemptions and all SMEs were required to comply with a number of unregistrable exemptions (see Wilson *et al.*, 2011 for compliance with exemptions). Of the 20 SMEs, 10 were classified as non-hazardous waste transfer stations, 4 as hazardous waste transfer stations, 1 as a scrap metal yard, 3 as WEEE Approved Authorised Treatment Facilities (AATF), 1 as an Authorised Treatment Facility (ATF) and 1 as an in-vessel composting operation.

The results show that 'letter of the law' compliance was low in some areas with room for improvement in others. Overall, compliance with common conditions was 56%. These results reflected the topics discussed in management interviews; waste SMEs awareness' and knowledge of environmental legislation was measured in terms of regulatory acceptability rather than that stipulated in the permit or in the legislation. Sixty percent of SME managers admitted to not being able to identify any requirements in their EP and only 35% of SME managers confirmed that they had any compliance assurances in place, although none of these were designed to measure overall compliance.

The results for **general management** show that only 25% were able to demonstrate that their site was managed in accordance with an accident management plan (known as a 'working plan', pre-EP) as set out by the EA (2008). Despite this, 80% were able to demonstrate that they had a technically competent person on site, had 'cover' for the site or that they were in the process of being approved as competent (i.e. falling inside the then 2-year Waste Management Industry Training and Advisory Board [WAMITAB³] 'grace' period). Where sites did not have an individual with the required qualification, the EA did not appear to be putting any significant pressure on the operator with it generally being left up to the WAMITAB approved assessor to try and push through the qualification; the EA did not appear to understand the process or mechanics of the qualification. This was supported by the EA officer interview as well as anecdotally from experiences during 'spirit of the law' audits on waste sites – EA officers put a lot of faith in the WAMITAB assessment process, despite not understanding it, not knowing how to interpret whether progress was being made and despite the assessors operating under the direction of the 'client' believed that the competence assessments were regulatory driven.

Records (i.e. site diaries) were inconsistently completed (65%) and 50% of sites failed to provide key staff with access to the EP. Where EPs were provided, these were not well

³ WAMITAB is the awarding body for the waste management industry in England, Wales and Northern Ireland and joint awarding with SQA, for qualifications in Scotland.

communicated and thus compliance was poor. Sites did not comply well with the requirements to maintain, implement, review and record changes to **accident management plans** (as specified by the EA, 2008); scores of 20% and 15% were recorded. Compliance with specified **operations** was generally much higher than other EP conditions. Operational conditions were generally more clear-cut. Despite this, it was recognised that in most cases, these limits were set so far above standard operating limits that it would be extremely difficult to breach them (an indication of the standard nature of EP conditions). There was evidence on a number of sites that where the above restrictions limited potential profitability, the operators were willing to breach them (e.g. daily input and total storage limits). The EP generally restricted the site to maximum daily limits of waste inputs as well as maximum storage limits and 75% of sites were judged to be compliant. Overall, the common '50 tonne total waste storage' limit was the primary reason for non-compliance as opposed to breaching daily input limits.

The audits identified that 65% of sites complied with the 'waste acceptance requirements' of their EP. This restricted operators to only accepting the European Waste Catalogue (EWC) coded waste as specified in their EP. Where breaches occurred, these were generally attributed to sites receiving waste either accidentally in a load or deliberately where they didn't want to turn away a customer.

Overall, 80% of sites complied with the maximum quantities as stated by their EP (25% of these sites were presumed to be compliant but it could not be proven). The remaining 20% of sites were aware of the breach but felt it was acceptable; there was no evidence of any significant pressure from the EA to meet these limits.

Less than half the sites (45%) could demonstrate compliance with **emission and monitoring** requirements (in terms of fugitive emissions). The majority of offences related to a failure to (only) store waste inside a building (where required in the EP). Further offences related to the control of dust as well as waste not being stored on impermeable surfaces. Very few sites appeared to have any knowledge of the EA guidance relating to emission control and/ or had evidence to demonstrate this. Only 25% of sites met the requirements relating to secondary containment of liquids; however, sites were generally felt to meet conditions relating to control of odours, noise and vibration.

Compliance with **information** requirements was mixed, with keeping of records (55%) and provision of quarterly returns (65%) moderately met; however, notification of incidents to the EA and the provision of written records of incidents was poor (5%) despite this being clearly being set out by the EA (2008). Sites generally failed to recognise what had to be reported and when and since most failed to realise what constituted an offence they didn't feel they had to report. Most felt it to be odd that they should inform the EA of any incidents, malfunctions, maintenance issues as this would in-effect increase the spotlight on them; in essence, they didn't want to "*open a can of worms*". These non-compliances constitute offences under regulation 38(1)(b) of the EP Regulations: "*to fail to comply with or to contravene an environmental permit condition*".

Overall, the audits and interviews showed that although knowledge and understanding of some issues was better on permitted sites, SMEs' compliance with specific permit conditions was poor. The following additional points can be drawn from the study:

- Little attention was paid to specific permit conditions with sites 'aiming' to operate in conjunction with the outcome of the EA inspections.

- Sites generally complied well with infrastructure requirements such as impermeable hard-standing and sealed drainage. This was generally because some operations were based on previous waste sites where the infrastructure was already in place and “*hard engineering*” requirements were seen as being ‘less negotiable’ with the EA.
- Compliance with ‘operational’ conditions such as daily treatment and annual throughput limits were well met. This was primarily because conditions were set well above operational levels and thus it would be unlikely for them to be exceeded.
- Where it was a benefit to breach conditions, some sites viewed this as acceptable as long as the situation was rectified once identified by the EA.
- There were breaches of paperwork requirements on all sites, for instance, site diaries were not well completed and accident management plans/ working plan were not ‘managed’; it was clear that there was contempt for many of the administrative requirements in EP.

Waste SME compliance with ‘other’ environmental legislation

A key objective of this study was to determine the strength of the link (if any) between permit compliance and compliance with ‘other’ environmental legislation. Table 4.35 shows compliance scores on waste sites for a range of environmental legislation; compliance scores on 4 other sectors are provided for comparison.

Waste SME scores were above the average sectoral scores for all but one piece of waste legislation (Duty of Care Regulations), but below average for all but one piece of water legislation (Water Resources Act). On analysis, the differences were not deemed to be statistically significant enough to suggest that the increased pressure of the EA and regular inspections are having a disproportionately positive effect on compliance with other environmental legislation (See Appendix 13 for Kruskal-Wallis test). An analysis of SME compliance with environmental legislation is reported in Wilson *et al.*, (2009, 2010 and 2011).

It can be argued that waste SMEs typically have to comply with more legislation than the average business as well as having to operate more complex sites where there is more ‘opportunity’ or ‘likelihood’ of a breach occurring. For instance, due to the increased amount of waste movements, any lapse in paperwork completion could result in a multiplication in the number of offences. As a consequence, it seems that the link between the EA Opra/ CAR system and the control of ‘other’ environmental legislation is weak, probably because there isn’t any specific formal inspection regime for ‘other’ environmental legislation, rather than inspection being worthless. Discussions with the EA highlighted that its visits appeared to be primarily ‘inspection’ rather than ‘audit’ based (although there appears to be a move towards more periodic but in-depth audits). Therefore, there is no programme of checks in place that would help identify breaches, with only the most obvious issues being identified.

Discussion

This section discusses potential improvements to the compliance controls for SMEs based upon the results obtained from the study:

- The first section describes an initial assessment methodology for SMEs not directly regulated under environmental permitting regimes. This includes an assessment of the current local authority SME inspection regime.

- The second section sets out environmental compliance performance indicators that can be used by SMEs and regulators.

Initial assessment methodology

Previous studies by Wilson *et al.*, (2009, 2010 and 2011) suggest that there are:

1. Businesses not included in any inspection regime that pose an environmental risk. This is indirectly supported by the EA (2006b) who acknowledge that poor management leads to unacceptable environmental impacts.
2. Improvements that can be made to the effectiveness of the current regulatory inspection system for sites directly regulated under the EP regime.

1. Initial assessment methodology

This element of the study aimed to develop an initial assessment methodology for SMEs not directly controlled under environmental permitting. An objective also considered the current LA SME inspection regime. A natural follow-on from this is to set regulatory priorities and identify the required level and frequency of compliance assessment.

We suggest that an assessment methodology should be predicated on the risks posed to human health and the environment taking into account how sites are managed and their compliance levels. This essentially builds on the Opra approach but includes a number of subtle changes in order to shift the emphasis onto 'controls' and 'compliance' and away from an activity's 'location', 'complexity' and 'emission' levels (i.e. hazards).

Our studies suggest that the following issues exist with how risk is currently assessed:

- 'Risk' as a concept is confused with 'hazard'.

A hazard is anything that can cause harm, whereas risk is a combination of a hazard's likelihood and severity.

- The risk assessment process is being used to justify rather than inform decisions.

Such is the theoretical evidence base of the need and success of risk assessment, it is influencing decision makers to show what society feels should be done. However, in practice it is more important that risk is properly assessed, rather than being *seen* to be assessed.

- 'Risk' is treated as a static concept.

Risk is based on a complex number of factors, including human interference which is ever changing and fundamental to how hazards are controlled. The concept of risk also impacts people's perception of it and thus can result in changes in behaviour to a situation because of a perceived lower risk level. This study suggests that 'risk' is cyclical – as controls improve, it can lead to complacency and more risky activities being undertaken; positive feedback can result in higher risks, as the risk is perceived to be reducing (e.g. bunding an oil tank reduces the immediate risk but can lead to the operator eventually installing a bigger tank and being less careful about how it is managed). By increasing regulatory contact, this may improve the level of compliance to its highest possible point. Therefore, it may be best to move this resource elsewhere until compliance drops. Compliance activity should not therefore be fixed; it should be based on a sample of evidence and targeted at those areas that have a higher environmental impact and/ or poorer levels of compliance.

There is huge difficulty in determining 'risk' without understanding how sites are managed, i.e. without conducting some form of inspection. There is irony in trying to develop an assessment

methodology that can be used to determine the need for inspection (and its frequency) without actually conducting inspections. Real 'risk' is primarily controlled by management competency rather than the inherent 'hazard' associated with an activity.

The results again highlight that face-to-face contact is the most effective method of communicating with SMEs (Fairman and Yapp, 2005). Therefore, the challenge is to make regulatory inspections a cost-effective alternative that is an underlying part of the risk assessment framework.

Any initial assessment methodology should consider the probability and severity of the hazards, combined with compliance data and an assessment of operator ability to manage risk. According to how sites are classified, this should determine the level of compliance assessment/regulatory contact/ inspection (this concept is supported by Alexopoulou, 2007). The assessment criteria and methods are set out in Table 4.36.

Once this is determined, real 'risk' can be understood and resources can then be prioritised to the areas that need them most. This process should be repeated continually, because if it is really effective, the areas where resources are targeted should reduce in risk and thus resources can be moved to the next biggest risk area.

The above mix of approaches is supported by Sinclair (1997), who suggested that there are much richer policy options sitting between the 2 polar extremes of command and control regulation and self-assessment. Sinclair (1997) suggested that in the majority of circumstances, a combination of command and control and self-regulation provides the right balance of regulatory outcome. The Commission for Environmental Co-Operation (1999) also recognise the importance of setting an enforcement agenda which recognises that which needs to be monitored, the type of monitoring to be conducted and the frequency.

From prior research (Wilson *et al.*, 2007, 2009, 2010 and 2011), the authors believe that certain businesses should be included within the assessment scheme, including: manufacturing, engineering, printing and construction businesses. This is not an exhaustive list but we suggest that there needs to be a broader look at how different businesses pose a risk to the environment. We also need to look at what we're asking businesses to comply with. Based on whether or not compliance helps to prevent environmental harm and/ or whether it improves environmental performance. If compliance can be intrinsically linked to environmental protection then the latter can be more easily protected and by removing any unnecessary controls, this will help businesses buy into the idea of compliance.

Further thoughts on inspections

Collecting and analysing information on the compliance status of businesses is recognised as one of the most important elements of an enforcement program (OECD, 2004). Alexopoulou (2007) identified inspections as a backbone of any enforcement scheme, despite being resource intensive and needing to be carefully targeted.

Fairman and Yapp (2005b) observed that SMEs did not actively seek information on regulations, but they waited to be directed by the regulatory visits. This poses serious issues for SMEs that do not receive any visits. The authors also commented that once presented with the requirements by an inspector, SMEs were more proactive in ensuring compliance, especially with the more prescriptive structural requirements. SMEs tended to rely on the

inspector to specify how to comply with both the prescriptive and more self-regulatory requirements but for different reasons.

All regulators support the idea that inspections should be targeted with less inspection for those likely to be in compliance and more inspection for those likely to be out of compliance.

Monitoring is essential to:

- Detect and correct non-compliances;
- Provide evidence to support enforcement action; and
- Evaluate compliance program progress by establishing compliance status.

There are a number of sources of compliance information:

- Regulatory contact;
- Self-monitoring, self-recordkeeping, and self-reporting by the regulated community;
- Public complaints and
- Monitoring environmental conditions near a facility.

Self-monitoring can provide detailed information; however, it relies on the integrity and capability of the operator. Complaints can pick up offences not noticed by regulators, but they are sporadic with very few in reality being picked up by the public (Hutter, 1986). Monitoring environmental conditions allows offences to be detected without entering any facilities, but it can sometimes be difficult to prove this link.

The study's findings support the use of inspections as a mechanism to improve compliance and to reduce environmental impact. The key areas to consider are the amount and type of contact. Where inspections were conducted on the SMEs under consideration, the results from this and prior studies suggest that not all compliance issues were identified. An analysis of the interviews suggests that most of the regulatory investigations were prompted by complaints rather than through the routine inspections. Hutter (1986) found that complaints aren't necessarily the most reliable source of information as they are not necessarily prompted by the most serious offences; this is compounded by a heavy reliance on the public to report offences as they do not possess the requisite knowledge to identify offences.

The study highlights that the regulatory authorities are either unable (due to lack of resources)/failing to implement their enforcement policies or they are unable/failing to identify non-compliances due to the infrequency or limited nature of their inspections. It also suggests that the regulators may not consider compliance with certain regulations to be essential to ensure environmental protection and thus there was no need to prosecute.

During a joint visit to an SME with the EA, it was felt that the inspection didn't achieve as much as it could have and was in danger of becoming a "*friendly look-around*". The enforcement officer reported a lot of benefits from sites visits that aren't always obvious or result in an immediate outcome:

- Visits give the regulator a face/ presence;
- Businesses rely on regulator contact to find out information and ask questions; and
- Regular contact stops non-compliant behaviour from developing - just by doing a visit and not finding anything does not mean this has been a waste of time. As a consequence, we need to consider the impact of reducing inspections as well as increasing them.

Williamson *et al.*, (2008) suggests that the best way to allocate resources is by using organisation size as a guide, with smaller firms generally being regarded as having less ability to comply and being more recalcitrant. There are a number of merits with this idea and there is evidence to suggest that smaller firms are less compliant than large firms (Hutter, 1997), but this is a generalisation and does not consider overall risk as there is no element of checking.

More regulator contact is a better substitute than more regulations for those who don't want to comply. Those who don't want to comply will ignore the new regulations. As a consequence, these types of businesses will only respond to more enforcement.

The following needs to be considered when deciding on how to measure the impact of inspection:

- Studies need to involve sites that are not subject to inspection.
- Increased inspections in the short term may lead to more non-compliance as there is more opportunity to identify non-compliance. The impact on compliance needs to be measured over longer periods of time.
- Businesses need to be assessed individually rather than measuring overall compliance in areas that are inspected more than others. The best way to measure the impact of regulatory contact is to use case studies, whereby an assessment is conducted before and after the increase in contact. Research by Sniffer (2009) into the use of inspections does not show the impact at a site-specific level. It compares one system with higher levels of inspection versus another system with lower levels of inspection. This was primarily because inspections on sites were risk-based and as a result you would expect a higher level of non-compliance on higher risk sites.
- As well as considering the impact of an increase in inspections, the impact of a decrease in inspection should be measured. From this, it may be possible to identify the point at which an increase in inspection is no longer effective and whereby a decrease in inspection is detrimental. It is important to be careful of the impact of re-directing resources away from those currently getting regulatory contact.
- The effectiveness of inspections isn't absolute; it changes over time as the company evolves and responds to inspections.
- The inspection methods used need to be documented and repeatable.

Overall, it can never be absolute that more inspections will result in better compliance but there will be a level where compliance is maximised. It is clear that in the UK, the different regulatory systems, business types and management levels are too complicated for 'compliance and inspection frequency' to be measured without other factors being considered.

Local Authority SME inspection regime

This and prior research (Wilson *et al.*, 2010 and 2011) has shown that the LA inspection regime for UK SMEs is poor and inadequate. LAs also have poor understanding and knowledge of compliance issues. This is primarily down to the belief that there is little to assess SMEs against and/ or there are other more important categories. Wilson *et al.*, (2011) showed that none of the district and county councils in the north west of England were aware of The Site Waste Management Plans Regulations despite being responsible for enforcement.

There is little evidence of proactive enforcement activity being conducted by LA officers. An improvement may be to combine Environmental Health Officer (EHO) health and safety/ environmental health visits with environmental compliance assessments.

2. Current regulatory inspection system

The EA uses the 'Opra' system to dictate the level of inspection required on permitted facilities. This system has been in place for a number of years and is generally received as being a useful tool (Williamson *et al.*, 2008). Opra is described as a risk assessment tool designed to ensure that the EA prioritises those sites that pose a higher risk to the environment or are performing poorly. It is intended to ensure that environmental risk is assessed consistently (EA, 2010).

There are three different types or 'tiers' of environmental permit. The different types relate to how complicated the activity is.

- **Tier 1:** These registrations are for the simplest activities. There are currently no Tier 1 Opra permits.
- **Tier 2:** The EA make a decision whether or not to grant a permit. Tier 2 permits are for fixed charge permit activities.
- **Tier 3:** These permits are for the most complicated activities, with permits taking account of local issues and the activities carried out on site.

All the SMEs included in this study were classified as Tier 3 permits. This is based on 5 attributes, each of which is allocated one or more lettered bands. Operators are required to answer different questions; this becomes the site environmental risk assessment and then automatically the Opra-banded profile. Each attribute is banded from 'A-E' ('A-F' for the 'compliance' rating attribute). An 'A' rating means less 'regulatory effort' is needed, while an 'E' or 'F' means that more regulatory effort is needed because of a higher perceived environmental risk (EA, 2010, 2010b, 2010c). The 5 attributes are:

1. **Complexity** – the type of activity covered by the permit.
2. **Emissions and inputs** – the amounts allowed to be inputted and released from an activity.
3. **Location** – the state of the environment around the permit applicant.
4. **Operator performance** – the effectiveness of management systems and enforcement history.
5. **Compliance rating** – how well the permit rules are met (using the EA's Compliance Classification Scheme - CCS). This is worked out using the CCS points for each calendar year. This adjusts the annual subsistence charge (EA, 2010, 2010b, 2010c).

The main criticism of the Opra scheme is its lack of robustness in responding to an individual site's circumstances (Wilson *et al.*, 2008 and Williamson *et al.*, 2008). It appears to be based on 'hazard' rather than 'risk', resulting in businesses not being able to influence much of the score. For example, the score for the 'complexity' and 'emissions' attributes are dependant on what a facility does and how much waste it brings in (for instance). Since sites are grouped into categories, some may be given an unnecessarily high score because they don't quite 'fit' into another (lower) category (e.g. a site receiving empty oil tanks for storage prior to onward disposal elsewhere is categorised as a metal recycling site).

Whilst it is reasonable to assume that the more waste (and hazardousness of the waste) a site receives, the higher the potential risk to the environment, this is only 'potential' (i.e. hazard) not actual risk. These two attributes are unlikely to alter an applicant's mind with regard to type of

facility they want to run; reducing the tonnage will reduce the score, but this is primarily a commercial decision rather than a significantly increased environmental risk. The 'location' attribute is also one that cannot be influenced as the decision to operate on a specific site is taken long before the Opra assessment is conducted and thus there is no way of being able to reduce the final score, without taking the expensive decision to find an alternative site.

With the above discussion in mind, the 'operator performance' assessment is the first attribute that can be affected by the operator. The scores in this attribute are dictated by the strength of the applicant's management system – typically covering: operations and maintenance (20% weighting); competence and training (20% weighting); emergency planning (20% weighting); and organisation (weighted 40%). Where there is a history of enforcement action, this reduces the operator performance score by up to 40%; operator performance remains unchanged (i.e. 0% weighting) if there has not been any enforcement action.

Despite the importance of good 'operator performance' to mitigate risk, there isn't a significant difference in the final Opra score. When a 'C' banded site (i.e. waste transfer station) with an 'A' rated 'operator performance' is compared with an 'E' rated 'operator performance' (using version 3.5 of the Opra scoring spreadsheet) the application fee only increased by ~£2,000 from £9,185 to £11,189. Although the second site was managed to a significantly higher standard, this was not reflected in proportionally less fees.

Following completion of the above assessment and after issuing the permit, the final 'compliance rating' attribute is calculated. Permit breaches are classified under the CCS scheme, with the number of non-compliances identified and recorded in the previous year being used to work out the compliance rating for the following year. Where a serious management system failure is identified, the management system section of the Opra profile is reviewed. No CCS points result in a band 'A' score, with 150 points or more (equivalent to two category 1 and one category 2 incidents) producing a band 'F' (NB. a category 1 incident is the most serious).

A compliance rating of 'A' reduces the subsistence score to 95% of the Opra score, a 'B' rating keeps the score at 100%, a 'C' rating increases the score by 110%, a 'D' rating by 125%, an 'E' rating by 150% and an 'F' rating by 300% (EA, 2010c). Similarly to the above, the incentive for an exemplar compliance rating is minimal (5% reduction); the main incentive being that the consequence for compliance failure is a financial penalty. The sites studied tended to try and avoid contact with the EA rather than using it as a source of information. Despite Opra not being well understood, sites felt that discussing issues amounted to heavy scrutiny from the EA – perhaps this attitude would change if there was a higher reward for compliance.

It is clear that the Opra system has a lot of merit in that there are no fundamental issues with the attributes or the associated questions. However, it is felt that improvements could be made to the scoring system. Rather than the 'complexity', 'emissions and inputs' and 'location' attributes being assessed individually, it is recommended that the 'operator performance' attribute is re-designed so that it exerts more influence over them rather than sitting alongside them. The first 3 attributes should be treated as hazards with 'operator performance' being treated as the controls. If the controls are good then this should significantly reduce the risk of even the biggest hazard. It is recommended that the 'compliance rating' attribute continue to be used as a way to reduce or increase the surveillance costs, however, there should be a more positive reflection for sites in the upper quartiles (i.e. at present an 'A' banded site only has subsistence fees reduced by 5%); this should more closely match the negative impact of scoring poorly.

Compliance performance indicators (CPIs)

In spite of the widespread recognition of the important role SMEs play in most economies, limited research has focused on current compliance levels (Wilson and Williams, 2008). Part of the solution could be to develop internationally applicable compliance performance indicators (CPI) that can be used by both regulators and SMEs.

It is clear that there needs to be balance between the most effective approaches to enforcement and the most cost-effective. The Commission for Environmental Co-Operation (1999) suggests that some enforcement may just be too costly and compliance may have to be sacrificed to lower costs. Despite this, while we cannot be certain what causes industry to comply, it is generally agreed that without a real threat of enforcement, this is no incentive for industry to comply.

Compliance indicators could assist in a more precise determination of compliance levels and their associated triggers. Raw enforcement figures aren't enough to measure effectiveness but the Commission for Environmental Co-Operation (1999) suggests that compliance could be used as an indicator of effectiveness if compliance is accurately measured. Resources could then be targeted at the worst areas.

Indicators, sometimes known as 'Key Performance Indicators' (KPI) or 'Key Result Areas' (KRA), are used to demonstrate 'performance' in all business areas; their importance is stressed by Defra (2005). At an international level, the International Network for Environmental Compliance and Enforcement (INECE) (2008) define environmental compliance and enforcement indicators as a "*Person, thing or device that measures, records or declares something. A piece of information that provides evidence on matters of broader concern*".

Although lots of environmental indicators exist, e.g. the EA use 'emissions from regulated facilities' and 'number of pollution incidents', the traditional indicator of compliance tends to be 'environmental fines – KPI 24' (Defra, 2005). There don't appear to be any indicators for compliance with specific legislation. UK LAs currently use 'BV166' – "*Environmental health and trading standards checklist*". This aims to ensure that LAs have the procedures in place to carry out their enforcement duties effectively. The indicators relate to whether written enforcement policies are in place as well as different compliance approaches, however, they aren't specific to enforcement/ compliance of individual legislation. Research (Rao *et al.*, 2006) has shown that the only compliances identified are those picked up by enforcement officers; enforcement activities are not an effective way to measure compliance levels (Wilson *et al.*, 2011b). There needs to be some initial research (pain) to identify compliance before focusing resources on the least compliant businesses.

The following rules should be followed when developing CPI at both national and international levels:

- They should include 'general' as well as 'regulation-specific' indicators;
- They should include indicators for 'compliance' as well as 'non-compliance' – particularly as there is sometimes confusion between those definitions.
- 'Compliance' should not be favoured over 'environmental performance'. As a consequence, legislation needs to be designed around the levels of environmental performance desired; environmental performance indicators should be used to dictate compliance requirements.

- Some CPIs are more significant than others. This could be solved by ranking or scoring, based on whether the risk is administrative or more serious.
- Indicators should cover direct, i.e. land/ groundwater contamination, flora, fauna damage, nuisance, urban blight and indirect, factors, i.e. lack of compliance register etc... The direct causes should be more highly rated than the indirect ones.

As an example, the following CPI are suggested for a typical waste producer for the waste Duty of Care in England and Wales:

General

- Individual identified as being responsible for waste management.
- Waste compliance audits conducted.
- Legislation identified and evaluated periodically.
- Environmental/ waste management system in place.
- Waste movement monitoring conducted.
- Number of complaints received.

Specific

- Evidence of an escape of waste and/ or land/ groundwater contamination.
- Evidence that company caused another company to cause an offence.
- Waste transfer notes in place for each separately collected waste stream identified.
- Number of waste movements without waste transfer notes.
- Two years of waste transfer note evidence for each separate type of waste removed.
- All requirements on waste transfer notes completed.
- Waste carrier licences in place for all waste carriers used.
- Number of waste movements by unregistered carriers.
- Waste carrier licences in date, documented and a system in place to update after expiry.
- Third party environmental permits in place.

Conclusions and Recommendations

This study has evaluated and outlined potential improvements to compliance controls for SMEs. Using a UK-based system as an illustration, we have identified weaknesses in the current system for assessing the compliance of SMEs with environmental legislation. Although the study has only considered a sample of environmental legislation that SMEs are required to comply with, if extrapolated, it is felt that similar issues would be identified in other regulated areas. Many SMEs are at the beginning of the social compliance journey - i.e. the majority are 'unconsciously incompliant' and have a long way to go to be 'unconsciously compliant'.

The follow specific conclusions can be made from this study:

Compliance and awareness

- Letter of the law compliance with EPR was moderate overall but hugely varied; compliance with 'accident management plans' scored lowly, compliance with 'general management' requirements scored moderately and compliance with 'operation' requirements scored highly (Table 3.34).
- Waste SME scores were above the average sectoral scores for all but one piece of waste legislation (Duty of Care Regulations) and below average for all but one piece of water

legislation (Water Resources Act). The differences were not deemed to be statistically significant enough to suggest that the increased regulatory 'pressure' was having a disproportionately positive effect on compliance with other environmental legislation (Appendix 13).

- SMEs' awareness and knowledge was based on regulator 'acceptability' rather than that stipulated in the EP or legislation.
- The UK Government (and indeed, other European governments) has different individuals/ departments responsible for different legislative areas – SMEs have to do all this by themselves and this can result in a significant cumulative burden if all compliance objectives are met.
- There are a lot of bodies involved in environmental enforcement; for instance, under the WEEE Regulations – the EA (regulate producer and end user requirements), the Vehicle Certification Agency (regulate distributor requirements) and the Distributer Take-back Scheme is administered by 'Valpak'. This causes confusion amongst SMEs and leads to inefficiencies in inspections.
- There needs to be more of a focus on 'micro' (<10 staff and <€2m turnover) and 'small' (<50 staff and <€10m turnover) SMEs.

UK EA Opra

- The link between the EA Opra/ CAR System and the control of 'other' environmental legislation is weak (the most regulated aren't necessarily the most compliant). This is due to their being a lack of a co-ordinated inspection regime for all environmental legislation, rather than inspections not being worth while.
- The Opra system is based on 'hazard', rather than 'risk' with operators not able to influence much of the final score. Risk is not well assessed and is overly relied on by regulators and policy writers.
- Good 'operator performance' doesn't significantly reduce the Opra score. The "reward" for good compliance is also insignificant.
- EA contact with permitted sites was primarily via 'inspection' rather than 'audit'. There was no formal programme of checks in place to identify breaches in non-permitted sites.

Inspections

- Inspection can be used as a mechanism to improve compliance and to reduce environmental impact. Regulatory authorities are either failing to implement their enforcement policies or they are failing to identify non-compliances due to the infrequency or limited nature of inspections. Further research is needed to identify the optimum level of regulatory contact.
- The LA inspection regime is inadequate.
- The lack of a clear link between compliance and inspections doesn't mean inspections aren't worth doing. However, the way they are conducted needs to be reviewed.

Compliance Performance Indicators

- CPIs can be used by both SMEs and regulators, they should indicate 'general' and 'specific' indicators as well as indicators of 'compliance' and 'non-compliance'.
- National/international regulations, rather than separate regulations for different jurisdictions would make it easier for businesses working in more than region/country; certainly a more consistent approach across Europe would benefit many businesses.
- We need to look at what we're asking SMEs to comply with. A common assumption is that businesses will be aware of, and understand how to comply with a rule when it is published. However, rapid increases in the complexity and volume of new regulations can make this basic assumption unrealistic.

- The legislation isn't readily understandable or in a particularly clear format – it is easy to have lots of breaches and thus how it is written and presented needs to be reviewed, with stakeholder involvement vital to the success of such a review.

The following specific recommendations can be made from this study:

UK EA Opra System

- Re-design Opra so that 'operator performance' exerts more influence over the other attributes. The first 3 attributes are 'hazards' and operator performance is the 'control'.
- The 'compliance rating' attribute should be re-designed so there is a more positive incentive for sites to be compliant.

Initial Assessment Methodology

- A risk assessment methodology should be based on the risks posed to human health and the environment taking into account how sites are managed and their compliance levels.
- The following needs to be understood before an SME risk framework can exist: the hazardousness of SME categories, combined with compliance data and an assessment of operator ability to manage and control risks. A methodology for achieving this includes an SME category assessment, SME competence self-assessment and more detailed, better co-ordinated audits (Table 3.36).
- It would be beneficial if EA officers had an audit checklist that was more detailed and covered all key environmental legislation rather than just EP conditions.
- SMEs should be required to demonstrate some form of environmental competence similar to the waste industry.

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Tables

Table 4.34 Compliance with The Environmental Permitting (England and Wales) Regulations

Permit Conditions	Compliance TOTAL
No. of SMEs audited (actual number)	20
No. of SMEs obligated by the regulations (actual number)	20
General management (%)	
Management system and technical competence	25
Records	65
Access to permit	50
Technically competent person	80
Accident management plan (%)	
Maintain and implement an accident management plan	20
Record changes to the plan	15
Operations (%)	
Permitted activities	75
Waste acceptance (waste types)	65
Maximum quantities	80
The activities shall not extend beyond the site plan	80
The activities shall not be carried out within 200 metres of a European Site or a SSI	100
Emissions and monitoring (%)	
Appropriate measures for fugitive emissions	45
Fugitive emissions management plan (if required)	(4) 100
Secondary containment for liquids	25
Emissions free from odour	95
Odour management plan (if required)	-
Emissions free from noise and vibration	90
Noise and vibration management plan (if required)	-
Information (%)	
Records	55
Reporting	75
Quarterly returns	65
Notify the EA (if required)	5
Provide written confirmation of actual or potential pollution incidents and breaches within 24 hours (if required)	5
Inform EA when monitoring taking place (if required)	-
TOTAL COMPLIANCE (%)	56.2

Table 4.35 Waste-sector compliance with 'other' environmental legislation compared to other SME sectors

Sector	A	B	C	D	E	Average
Legislation (%)						
Environmental Protection Act ss. 34 Duty of Care	26.7	27.3	36.0	44.0	24.0	35.5
Duty of Care Regulations	36.4	60.5	69.7	48.1	46.4	51.0
Hazardous Waste Regulations	3.4	28.7	2.0	28.5	6.3	22.3

Sector	A	B	C	D	E	Average
Legislation (%)						
Control of Pollution (Amendment) Act and associated regulations	-	-	-	100	100	100
Waste Electrical and Electronic Equipment Regulations	0	26.3	0	42.9	0	28.6
Environmental Permitting Regulations – waste exemptions	100	46.2	100	66.7	56.3	64.1
Oil Storage Regulations	77.0	72.5	86.3	63.3	62.5	71.2
Groundwater legislation*	100	100	100	65.0	60	79.5
Water Industry Act*	33.3	63.6	100	60	40	61.4
Water Resources Act*	66.7	81.8	100	90	40	81.8
Environmental Permitting Regulations – permit requirements	-	-	-	56.2	-	56.2

*Results recorded on a site-by-site basis.

KEY: Industry Type

Sector A: Printing

Sector B: Manufacturing

Sector C: Hotel/ Catering

Sector D: Waste

Sector E: Construction

Table 4.36 Initial SME assessment criteria and methods

Ref	Assessment Criterion	Method
1	Assess hazard by SME category (using 'Opra' attributes)	Desk-based study based on enforcement evidence, prior research (including the findings from this research) and anecdotal evidence from industry.
2	Assess the competency of SME management	SME self-assessment. This could be conducted and administered similarly to how this is done in pre-qualification questionnaires or that contained within health and safety contractor assessment schemes.
3	Determine compliance levels (combined with an assessment of the amount of regulations businesses have to comply with)	Replace inspections with less frequent but more detailed compliance audits. These could be conducted on an opportunity basis; making them more detailed using a standard format will make the most of the resource available and provide valuable data. The audits could either be undertaken by different regulators as they get the opportunity or be pooled and conducted by one regulator. This should make them more effective and efficient rather than several regulators visiting the same site at different times to look at different legal areas. A database of compliance could be held to build up a picture over time.

CHAPTER 5

SUMMARY OF DISCUSSION

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5.1 General discussion

This thesis has investigated a number of distinct areas associated with environmental compliance in SMEs. Whilst these have been presented in separately published peer-reviewed papers/ conference proceedings, this Chapter draws together and summarises the key themes and aligns them with the stated aims and objectives from Chapter 1. The results have also been summarised in Appendix 12 in a paper presented at the IEMA Knowledge Exchange Conference in Manchester (January 2011).

This study produced a novel environmental compliance methodology approach. Whilst environmental auditing is recognised as a tool for improving compliance, there is little published research specifically on environmental compliance auditing techniques. This study reviewed the general auditing literature and used experiences and research data generated from compliance auditing to demonstrate how a specific environmental compliance assessment approach can be developed for SMEs. This study suggests that a 'regulation-specific' auditing approach is an effective way of determining legal performance in SMEs, although this needs to be supported by specific methodologies and strategies for each regulation audited.

'Small' and 'micro' businesses are distinctly different from 'medium' sized organisations (as supported by Hillary, 2000). 'Compliance support' needs to be more directly focused on 'small' and 'micro' SMEs rather than SMEs in general. This is compounded by regulators, support organisations and Government departments not having sufficient awareness of the issues facing SMEs; in particular they consider 'SMEs' to *only* include 'micro' sized businesses. The results from the SME/ regulator/ policy maker interviews suggest that prescriptive requirements are preferred as long as they are clear, easy to follow and avoid complex exemptions/ exclusions (this is not currently the case); this is supported by Tilley (2000), Fairman and Yapp (2005b), Anderson (2009), Hopkins (2007), Wilson *et al.*, (2011) and Alexopoulou (2007). It is difficult to measure the preference for prescriptive requirements from the compliance audit results because by their very nature they can result in lower compliance scores because there are more requirements to measure against. It is suggested that if the requirements are clear and auditable that over the longer term compliance will improve. In demonstrating the preference for prescriptive requirements, comparison can be made with the modest up take of the environmental management standard, ISO 14001, whereby clauses are non-prescriptive and instead of giving flexibility, cause confusion (there are 8,684 registered UK firms – representing 0.184% of UK businesses, IEMA, 2010).

In the context of the 'regulation of environmental risks', it is recognised that there are other if not more equally important environmental legislation which must be complied with in order to protect the environment. The amount of environmental legislation not covered in this study is representative of the total amount of UK environmental law potentially affecting SMEs. It is difficult to compare these results with larger businesses or indeed SMEs in other parts of Europe, primarily because there are a number of other contributing factors and little other similar studies to compare with. For instance, larger businesses tend to have more resources to identify compliance issues which in the short term could lead to more non-compliances being identified. Research conducted in European SMEs by Remas (2006) suggested that there is some evidence that improved site environmental management leads to lower average emission levels, but not necessarily better compliance *per se*. Case study based research is required in order to effectively compare improvements in compliance in different sized businesses and in different regions of Europe.

This study had 3 key aims:

- To determine and evaluate the level of compliance with environmental legislation in SMEs.
- To evaluate the impact and effectiveness of environmental legislation in SMEs.
- To evaluate and improve the environmental compliance control systems for SMEs.

The key themes from the aims and objectives have been discussed below:

5.1.1 Levels of compliance with environmental legislation

A summary of environmental compliance across all sections is provided in Table 5.1. This shows that overall compliance was 49.9%, although it was acknowledged that several 'poor' scores were skewed by some higher scores. The moderate or poor levels of compliance, knowledge and understanding outlined in Chapter 4 are supported in general by a number of other studies, including Bland *et al.*, (2004), Fairman and Yapp (2005), Taylor/ You Gov (2007) and Atkins (2007). When analysed statistically, there was no significant difference between the levels of compliance across the 5 sectors. A standard deviation test was also used to measure the difference in the number of obligations affecting each SME in each sector. Large standard deviations were reported for each sector indicating that the samples were far from the *mean* (see Appendix 13). This makes it difficult to compare compliance with individual regulations as the sample sizes were so spread out. A contributing factor for the low or moderate levels of compliance is the amount and complexity of environmental law (Williamson *et al.*, 2006, Ebbage, 2009 and Ends, 2008). This is further emphasised by the number of different government departments, regulators and support organisations charged with looking after different elements of environmental law; none appear to have an appreciation for the overall potential impact on SMEs.

SMEs also made little effort to comply, seeing 'compliance' as what the regulator identified rather than that set out in law. It was felt that due to many SMEs escaping regulator scrutiny, many failed to see the potential or actual offences caused and thus as described by Petts (2000) were "*vulnerably compliant*".

5.1.2 Impact and effectiveness of legislation

A key reason for environmental legislation not being effectively implemented or having much impact on SMEs is due to a general lack of regulatory contact, either because SMEs did not want to initiate contact and/ or because direct face-to-face regulator contact/ enforcement action is limited. This is compounded by those SMEs with negative perceptions and/ or attitudes of environmental law. It was felt that more effective enforcement is a prerequisite of an improvement in SMEs attitudes and perception of the 'environment'.

Face-to-face contact is acknowledged by a number of authors, including Fairman and Yapp (2005) and Alexopoulou (2007) as being the most effective method of engagement. Moreover, a great deal of environmental law is relatively new and thus other more established legislation such as employment law and income tax have become *more* accepted.

A further reason for ineffective implementation is how the UK implements European requirements (as opposed to the EU requirements being inherently flawed). This study was not designed to support or deny the accusation that the UK 'gold-plates' EU requirements but it

suggests that we have certainly made it difficult in terms of codifying environmental legislation as it has built up over time. This results in a convoluted and complex system of multiple amendments, contradictions and an overall lack of clarity.

The study has shown that the consequence of low compliance levels is a potential for environmental harm. This was more evident with certain waste legislation such as the duty of care and hazardous waste legislation. Despite this, the link between compliance and environmental protection was not always clear; this may in part explain the difficulties some SMEs had understanding the need for some legislation.

5.1.3 SME compliance control system

This study has shown that because of the sheer number of SMEs, there needs to be an effective system of regulation which controls activities and targets those operators that pose a high risk to the environment. This study posits that at present, the EA's Opra/ CAR regime is not adequate due in part to its limited coverage (few SMEs are part of the scheme) and limited scope (inspections are limited to permit conditions rather than covering all environmental legislation). The inadequacy of the local authority inspection regime further compounds this problem (Wilson *et al.*, 2011).

'Risk' is inadequately assessed, with too much emphasis on the 'hazard' of an activity. This results in risk assessment being used to justify rather than dictate intervention methods. This study sets the principles for a more sophisticated SME screening framework in order to identify those SMEs that can pose a risk to the environment. This supports the use of a more fluid risk assessment methodology which complements rather than contradicts the traditional scientific approach of risk assessment as set out by Pollard *et al.*, (2006) and IEMA Practitioner (2005). It suggests that risk assessment methodologies should be based on the risks posed to human health and the environment taking into account what sites do (the 'hazard'), how they are managed and comply with legislation (the 'risk').

The study suggests that 'inspection' is an important enforcement tool; this is supported by Wilson *et al.*, (2011), OECD (2004), Williamson *et al.*, (2006), Fairman and Yapp (2005) and Alexopoulou (2007). However, the amount and type of inspection are crucial decisions to get right, especially considering the inevitable budget restrictions following the UK Government's post recession austerity measures (Defra 2010, 2010b and Sniffer, 2010). This is important for all regulators including local authorities because of the identified weakness in local authority inspection regimes (Wilson *et al.*, 2011). Because of the difficulties understanding environmental law, the study suggests that compliance performance indicators can be used by both SMEs and regulators to help determine and measure compliance levels.

Whilst this study was not designed to identify the impact or correct frequency of inspection, a number of considerations were identified for any study designed to measure the impact of inspection, including:

- Sites that are not subject to inspection need to be included in the research.
- It needs to be acknowledged that increased inspections in the short term may initially lead to lower levels of compliance as there is more opportunity to identify non-compliance. The impact on compliance needs to be measured over longer periods of time.

- Businesses need to be assessed individually rather than measuring overall compliance levels in areas that are inspected more than others. It is believed that case studies are the best way to measure the impact of regulatory contact, whereby an assessment is conducted before and after the increase in contact. Previous research by Sniffer (2009) did not show the impact at a site-specific level; it compared one system with higher levels of inspection to a system with lower levels of inspection.
- The impact of a decrease in inspections needs to be considered. From this, it may be possible to identify the point at which an increase in inspection is no longer effective and whereby a decrease in inspection is detrimental. It is important to be careful of the impact of re-directing resources away from those currently getting regulatory contact.
- It needs to be understood that the effectiveness of inspections isn't absolute; it changes over time as the company evolves and responds to inspections.
- It is important to explain the complexity of the audit and the length of time on site; inspection methods need to be consistent, documented and repeatable.

Overall, it can never be absolute that more inspections will mean better compliance but there is a level where compliance is maximised (i.e. an increase in inspection would not improve compliance levels). The different regulatory systems, business type and management level are too complicated for compliance and inspection frequency to be measured on their own.

The type of law that we're asking SMEs to comply with is also important; prior research has shown that making it more prescribed can make it easier for SMEs to understand (see above) as well as easier for regulators to audit. Certain specific improvements can be made to particular regulations that will enable environmental legislation to be improved (as outlined in Wilson *et al.*, 2011). At the time of writing, the Government is continuing to develop de-regulatory initiatives to try and reduce the impact on business; all of which could have a significant impact on future environmental legislation. This includes the 'Red Tape Challenge' (Cabinet Office, 2011), launched in April 2011 which invites people to comment on a huge number of regulations, including 278 pieces of environmental legislation. The Government has also introduced 'one-in, one-out' (BIS, 2011) and 'sunsetting' policies (BIS, 2011b). The former means that Ministers, except in certain circumstances can only introduce new legislation that imposes a net burden on business if they can also identify an equivalent regulatory measure to scrap. The latter means that regulations will be made, except in certain circumstances subject to time-limits and reviews. It will be interesting to see how these initiatives impact the regulatory environment for SME!

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Tables**Table 5.1 A summary of SME compliance with environmental legislation**

Sector**	A	B	C	D	E	Avg.
Legislation (%)						
Environmental Protection Act ss. 34 Duty of Care	26.7	27.3	36.0	44.0	24.0	35.5
The Environmental Protection (Duty of Care) Regulations	36.4	60.5	69.7	48.1	46.4	51.0
The Hazardous Waste Regulations	3.4	28.7	2.0	28.5	6.3	22.3
Control of Pollution (Amendment) Act and associated regulations	-	-	-	100	100	100
The Producer Responsibility Obligations (Packaging Waste) Regulations	0	0	-	-	-	0
The Packaging (Essential Requirements) Regulations	100	87.5	-	-	-	90.9
The Waste Electrical and Electronic Equipment Regulations	0	26.3	0	42.9	0	28.6
The Site Waste Management Plans Regulations	-	-	-	-	5.9	5.9
The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations	-	100	-	-	-	100
The Environmental Permitting Regulations – permit requirements	-	-	-	56.2	-	56.2
The Environmental Permitting Regulations – waste exemptions	100	46.2	100	66.7	56.3	64.1
The Control of Pollution (Oil Storage) Regulations	77.0	72.5	86.3	63.3	62.5	68.9
Groundwater legislation*	100	100	100	65.0	60	79.5
Water Industry Act*	33.3	63.6	100	60	40	61.4
Water Resources Act*	66.7	81.8	100	90	40	81.8
Clean Air Act 1993*	100	100	100	100	100	100
Statutory Nuisance under Part 3 of the Environmental Protection Act*	0	72.7	100	50	40	56.8
TOTAL COMPLIANCE BY SECTOR (%)	40.9	56.1	52.8	50.4	42.3	49.9

*Results indicate overall site compliance (rather than individual regulatory requirements)

**44 SMEs participated in the research

KEY: Industry Type**Sector A:** Printing**Sector B:** Manufacturing**Sector C:** Hotel/ Catering**Sector D:** Waste**Sector E:** Construction

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CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

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6.1 Conclusions

Following a detailed multi-methodology study, this research has shown that environmental legislation can be complex, convoluted and difficult to follow. This is emphasised by how the UK Government has a number of different individuals/ departments responsible for each different area of environmental law. SMEs have to undertake a significant collective knowledge burden, as well as meeting other legislation, whilst managing their business.

It is clear that a large number of SMEs don't understand anything about environmental compliance and none understood everything. More worryingly, the regulators, Government bodies and support organisations lack a holistic awareness and understanding of the collective compliance issues facing SMEs. This is partly down to the number of bodies responsible for environmental compliance; an indication of the complexity and size of the subject. If all these bodies are required then this goes some way to emphasising the 'potential' burden on SMEs.

For environmental compliance and the associated control systems to improve, we need to look at what we are asking SMEs to comply with as well as challenging SMEs to take more responsibility; 'other' business issues need to stop being used as justification for non-compliance.

There are a number of high-level academic and practical conclusions from this study:

- It provides up to date environmental compliance data for SMEs. The methods used could be extended to other regions of the UK and to other legislation.
- It develops a sophisticated methodology for conducting environmental compliance audits. The 'audit-ability' of environmental legislation should be considered in the legislation design phase.
- It investigates and challenges the link between environmental compliance and environmental protection.
- It provides insight into the way we think environmental legislation impacts SMEs and about how we judge effectiveness of legislation.
- It evaluates how 'directly-regulated' SMEs comply with 'non-permitted' environmental legislation and provides insight into how 'risk' is determined and how behaviours can be influenced, particularly in relation to how the Environment Agency's environmental risk assessment methodology can be improved.
- It provides insight into how environmental compliance control can be improved for SMEs; by providing an initial assessment methodology, for SMEs not directly controlled by Environment Agency or local authority permitting as well as providing regulators and SMEs with alternative approaches to ensuring compliance through the use of compliance performance indicators.
- It contributes to how research should be conducted when investigating the link between compliance and the level of regulatory inspections.

The following specific conclusions have been drawn from the results presented in sections 4.2.5 – 4.2.9 and Chapter 5. The results have been aligned with the aims and objectives stated in Chapter 1.

6.1.1 Compliance with environmental legislation

Letter of the law

- By using a novel methodological approach, this study has shown that overall compliance across all sectors was 49.9% (Table 5.1). These results indicate that compliance was 'moderate' at best and 'poor' in many cases, regardless of the sector. Sectoral scores were not found to be statistically different (ranging from 40.9% for the printing sector to 56.1% for the manufacturing sector) and variations between the number of obligations on each SME makes individual comparisons difficult (Appendix 13).
- Compliance was low for the waste duty of care (DoC) (35.5%), The Hazardous Waste (England and Wales) Regulations (HWR) (22.3%), The Producer Responsibility Obligations (Packaging Waste) Regulations (PRO) (0%), The Waste Electrical and Electronic Equipment (WEEE) Regulations (28.6%) and The Site Waste Management Plans (SWMP) Regulations (5.9%) (Table 5.1). These low scores are significant as some of the regulations applied to all SMEs in the study, with multiple breaches occurring (section 4.2.7).
- Compliance was high for The Packaging (Essential Requirements) (PER) Regulations (90.9%), The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) Regulations (100%), the waste carrier elements of the Control of Pollution (Amendment) Act (100%), groundwater legislation (79.5%), the discharge requirements under the Water Resources Act (81.8%) and the air pollution requirements of the Clean Air Act (100%) (Table 5.1).
- If the study was extended, it is posited that total compliance scores would reduce. The legislation is too un-auditable to identify total compliance from a snap-shot.
- The UK uses a range of policy measures to try and manage compliance, including command and control style legislation. However, it is suggested that whilst we continue to impose 'command' type requirements on businesses, there is little 'control' of this legislation. This begs the questions: have we left businesses to self-regulate law that is designed to be more closely enforced?

Spirit of the law

- Spirit of the law compliance was poor (knowledge, awareness and understanding of environmental legislation and compliance). This improved commensurate with effort. Knowledge of more established legislation such as the waste DoC and The HWR was better than for newer legislation.
- Knowledge amongst enforcement officers, Government policy writers and support organisations was patchy and/ or limited to a narrow area of expertise.
- SMEs' awareness and knowledge of environmental legislation was based on regulator 'acceptability' rather than that stipulated in permit conditions or other legislation.
- SMEs and local authorities in particular did not find environmental legislation easy to understand. The latter of which put little resource into enforcement
(See discussion in sections 4.2.5 - 4.2.9)

SME awareness and perception of environmental compliance

- SMEs did not consider the efforts required to comply to be comparable with the pollution threat of their activities. This was despite SMEs having poor knowledge of what constituted 'compliance'.
- SMEs considered 'compliance' to be what the regulator identified rather than that detailed in legislation.

- SMEs were not generally aware of their environmental impacts.
(See discussion in sections 4.2.5 - 4.2.9)

6.1.2 Impact and effectiveness of environmental legislation

Implementation

- The impact of environmental legislation on SMEs varied. In this study, 'impact' was considered to be a consequence of 'effort to comply' and 'enforcement pressure'.
- Although most SMEs felt the regulations were burdensome, they did not have a significant impact on the sites' audited as they did not initiate any significant changes to behaviour or operations. The impact in many cases was negligible.
- There is an 'accumulation' of environmental legislation on SMEs if all applicable environmental legislation is followed. All environmental policy areas need to be considered when making decisions on future regulatory control. The accumulation of environmental legislation is not appreciated by regulators and Government officials who worked independently.
- SMEs did not feel that the implementation of environmental legislation was effective. Extensive support was provided by regulators, but SMEs preferred to use other sources (despite them providing little environmental compliance support).
- SMEs thought the guidance provided with new environmental legislation was poor. SME market penetration was identified as the key barrier by regulators.
(See section 4.2.8)

Enforcement

- Enforcement activity and surveillance of SME compliance was very low; at the time of the study no national enforcement action had been taken under The WEEE or The RoHS Regulations. Enforcement under The PER Regulations is extremely low.
- Enforcement action taken against the SMEs studied was low; only 1 of 44 had ever been prosecuted, this was despite a high number of offences being identified (sections 4.2.5, 4.2.6 and 4.2.7). Of the SMEs not routinely inspected, only 1 had any environmental issues identified, with a second visited. Almost all waste SMEs had issues identified in inspections, although these didn't correlate with compliance audit data. These figures reflect national enforcement levels and suggest that there is little pressure to comply and a perception amongst SMEs that compliance isn't important.
- Non-compliance was only viewed as an issue for SMEs if raised by a regulator and only treated seriously if prosecuted.
- Although regulators had developed enforcement policies, these were inconsistently followed, with being seen to be "*working with SMEs*" more important than enforcement; deviation from enforcement policy was acceptable in a bid to encourage compliance, over time.
- Where businesses do not admit compliance failures and/or where they are not identified in inspections, it is likely that many more businesses are failing to comply with the environmental legislation presented in this study.
- SMEs were given responsibility to manage their own compliance. The lack of regulatory contact meant that the majority of SMEs had no opinion of how environmental legislation was enforced.
(See section 4.2.8)

Environmental protection

- The consequence of low compliance levels is a potential for environmental harm.
- There was evidence of direct and indirect environmental harm as a result of non-compliance. The potential for environmental harm was higher with failure to meet The DoC and HWR (e.g. waste being poorly managed) compared to producer responsibility legislation.

(See section 4.2.8)

6.1.3 Improving environmental compliance controls*EA Opra/ CAR and the control of 'other' environmental legislation*

- The link between the EA 'Opra/ CAR' System and the control of 'other' environmental legislation is weak (the most regulated aren't necessarily the most compliant). This is due to a lack of coordinated inspections covering all environmental legislation, rather than inspections not being worthwhile.
- The Opra system is based on 'hazard' rather than 'risk', with operators not able to influence much of the final score. Risk is not thoroughly assessed by regulators and policy writers; little attention is paid to SMEs' individual level of control.
- Good 'operator performance' doesn't significantly reduce the Opra score. The reward for good compliance levels is also insignificant.
- A limited number of SMEs were subject to inspection. Where inspections were conducted, they were inconsistent, uncoordinated and often treated out of context from previous inspections.
- Inspections and audits need to remain a key part of regulators' enforcement strategies. A reduction in the number of regulatory inspections increases the pressure on the remaining inspections. This study suggests that there is a level of regulatory inspection at which compliance can be maximised.
- EA contact with permitted sites was primarily via snap-shot 'inspections' rather than detailed 'audits'. There was no formal programme of checks in place to identify breaches in non-permitted sites.
- Inspection format needs to be developed. If inspection frequency has to reduce, they need to be coordinated over set 'compliance periods' to cover all permit conditions and other applicable environmental legislation; making them comprehensive and making them count.
- The lack of a clear link between compliance and inspection doesn't mean inspections aren't worth doing. However, the way they are conducted needs to be reviewed.
- Regulatory authorities are either failing to implement their enforcement policies or they are failing to identify non-compliances due to the infrequency or limited nature of inspections.
- The local authority inspection regime is inadequate. Little resource is put into enforcement. This is significant considering local authorities for policing a large number of SMEs.

(See section 4.2.9)

Initial assessment methodology

- Risk assessment methodologies should be based on the risks posed to human health and the environment taking into account how sites are managed and current compliance levels.

- A more sophisticated SME screening framework is required to identify those SMEs that can pose a risk to the environment; in particular those SMEs not party to an inspection regime.
- The following needs to be understood when creating an SME risk framework: 1) the hazardousness of SME categories, 2) compliance data and 3) an assessment of operator ability to manage and control risk.
(See section 4.2.9)

Compliance performance indicators

- Compliance performance indicators can be used by both SMEs and regulators to help determine and measure compliance levels. They should indicate 'general' and 'specific' indicators as well as indicators of 'compliance' and 'non-compliance' although 'compliance' should not be favoured over reduced environmental impact.
- Legislation needs to be designed to encourage the levels of environmental performance desired; environmental performance indicators should be used to monitor compliance requirements. Some indicators are more significant than others, e.g. an escape of waste compared to incomplete documentation; this could be solved by ranking or scoring, based on whether the risk is administrative or actual and immediate.
- Indicators should cover direct, i.e. land/ groundwater contamination, flora, fauna damage, urban blight and indirect, factors, i.e. lack of compliance register etc. The direct causes should be more highly rated than indirect causes.
(See section 4.2.9)

General

- Regulators, support organisations and Government departments do not have sufficient awareness of the issues facing SMEs. They consider 'SMEs' to only include 'micro' sized businesses.
- 'Small' and 'micro' businesses are distinctly different from 'medium' sized organisations. 'Compliance support' needs to be more directly focused on 'small' and 'micro' SMEs rather than SMEs in general.
- SMEs prefer legislation to be prescriptive. Comparison can be made with the modest up take of the environmental management standard, ISO 14001. Requirements are non-prescriptive; instead of giving businesses flexibility, it causes confusion.
(See section 4.2.5 - 4.2.9)

6.2 Recommendations

Further study is needed to understand all the issues relevant to environmental compliance in SMEs. Specific recommendations include:

- Investigating the link between environmental compliance and environmental protection; this will give better insight into the impact and effectiveness of environmental legislation.
- Identifying the most efficient level of inspection frequency, so the point at which inspections no longer become effective (and actually become negative).
- Inspection frequency should be dictated by how well environmental risk is managed rather than by environmental hazard.
- Local authorities should expand inspections to cover more environmental issues. Environmental audits could be bolted onto the current environmental health officer (EHO) inspections to reduce the cost burden.

- The SME definition should be reclassified with 'micro and 'small SMEs (i.e. <50 employees) separated from 'medium' sized SMEs (i.e. >50 employees). SMEs need to be considered in smaller cohorts; including those of less than 50 staff and those not party to any inspection regime.
- Different strategies are needed for different sized SMEs. Whilst online support may be adequate for larger SMEs, 'micro' and 'small' businesses need direct support.
- SMEs need guidance, support and indicators in order to measure their compliance. SMEs need support from organisations with a holistic knowledge of environmental compliance issues.
- UK-wide regulations would make it easier for businesses working in more than one part of the UK. Devolution has resulted in varying systems across the UK.

EA Opra/ CAR

- Re-design Opra so that 'operator performance' exerts more influence over the 'complexity', 'emissions and inputs' and 'location' attributes. These attributes are 'hazards', whereas 'operator performance' is the 'control'.
- The 'compliance rating' attribute should be re-scored so there is a more positive incentive for sites to be compliant; it should more closely reflect the negative scoring for non-compliance.
- EA officers should use a more detailed environmental compliance audit checklist (rather than the current CAR form) in order to identify all potential environmental non-compliances, not just those associated with environmental permits.

Initial assessment methodology

- Regulator risk assessments need to use compliance auditing as part of a screening process to identify environmental risk. This should help to provide a link between compliance and environmental protection.
- The methodology for achieving an appropriate SME risk framework includes the use of 1) an SME category assessment, 2) an SME competence self-assessment (a minimal standard needs to be set) and 3) detailed, better coordinated regulator audits.

6.3 Final Remarks

This study has identified weaknesses in the environmental compliance control system for UK SMEs. If the sample of environmental law studied was extended, it is felt that similar issues would be identified in other areas of environmental law. The study has shown that there are a great number of challenges to improving SME compliance controls, in particular because of a combination of people's perception of and attitudes towards the 'environment', a lack of clear legislation and a reduction in enforcement due to increasing financial constraints.

It is clear that the 'environment' is heavily regulated; the amount of law has grown significantly over the past 30 years. Despite this, environmental law has yet to be popularised to the same extent as other areas of law, such as health and safety and/or employment law. It is clear that many SMEs are at the beginning of the social compliance journey - i.e. the majority are 'unconsciously incompliant' and have a long way to go to be 'unconsciously compliant'. Understanding and working with SMEs is complex. We shouldn't forget that SMEs are more

than just being important to the UK economy; they are people's livelihood, retirement and inheritance.

The 'environment' as a subject polarises opinion. It needs to be popularised and professionalised in order for environmental impact and legislation to be taken more seriously. The 'environment' is also capricious and esoteric in nature, making it inconsistently viewed and inaccessible to society; this makes it difficult to plan for, long-term.

Despite environmental compliance and protection being there to protect us, it suffers from the 'tragedy of the commons'; it requires individual responsibility (including a willingness to 'pay') for common benefit. Other areas of law have much stronger personal drivers and motives, for instance, if a person is dismissed by their employer, employment law can either result in that decision being withheld and the individual losing their job or if overturned, increased litigation and cost for the employer. The consequence for non-compliance is individually more significant for some areas of law and as a consequence this makes individuals and businesses more litigious about their responsibilities and rights; perhaps reflecting the more hedonistic society that we live in. Whilst it is admirable for environmental law to seek the altruistic position that we should 'do the right thing', it is this very reason that it is failing to achieve its goals. If we can somehow make environmental compliance more personally rewarding or punishing then society will take much more of a personal interest.

This research has shown that in order to improve SME compliance controls it will require SMEs, regulators, policy writers and support organisation to work together. Working with SMEs is a 'contact sport', which means that we need strategies to engage with SMEs, rather than isolate them. The research suggests that face-to-face support is the most effective way of doing this, despite being costly. We need to focus our efforts on how we can achieve this while being mindful of budgetary constraints, rather than justifying our current approach; remembering that costly interventions that work, are better than cheaper ones that don't. In addition to the suggestions made in this research, one additional way this could be achieved is by better engaging the supply chain (i.e. a peer-to-peer approach) to facilitate change in SME attitude/behaviour. In many cases this is already happening, but it needs to be extended to all SMEs posing a 'risk' to the environment.

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GLOSSARY

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BERR: Department of Business, Enterprise and Regulatory Reform

BIS: Department of Business Innovation and Skills

BRTF: Better Regulation Task Force

BRC: Better Regulation Commission

BRE: Better Regulation Executive

BS: British Standard

BSI: British Standards Institution

CBI: Confederation of British Industry

CICS: Common Incident Classification Scheme

CCS: Compliance Classification Scheme

CIWEM: Chartered Institution of Water and Environmental Management

CIWM: The Chartered Institution of Wastes Management

DEFRA: Department for Environment Food and Rural Affairs

DTI: Department of Trade and Industry

EA: Environment Agency

EC: European Commission

EEPA: European Environment Protection Agencies

EMS: Environmental Management System

Ends: Environmental Data Services

Epistemological: the theory of knowledge

EP OPRA: Environmental Protection and Operator and Pollution Risk Appraisal

ESA: Environmental Services Association

FSB: Federation of Small Businesses

Hermeneutical approaches: understanding things from somebody else's point of view and to appreciate the social and cultural forces that may have influenced their outlook

IEEP: Institute for European Environmental Policy

IEMA: Institute of Environmental Management and Assessment

NAO: National Audit Office

OPRA: Operator & Pollution Risk Appraisal

Opra: Operational Risk Appraisal

MCEI: Minimum Criteria for Environmental Inspections

OECD: Organization for Economic Cooperation and Development

RDAs: Regional Development Agencies

SBC: Small Business Council

SBS: Small Business Service

SNIFFER: Scottish and Northern Ireland Forum for Environmental Research

UNEP: United Nations Environment Programme