Evaluating the Cumulative Impact of Safety, Health and Environmental Regulation on the UK Industrial Coatings, Aerosols and Speciality Chemicals Sectors

Final Report

for

Chemicals Unit, DTI

By

London Economics in association with

RPA

August 2006

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Glossary of terms

ABI: Annual Business Enquiry

ADR: European Agreement

ATEX: Atmosphere Explosive Regulation

BACS: British Association for Chemical Specialities

BAMA: British Aerosol Manufacturers' Association

BCF: British Coatings Federation

BPD: Biocidal Products Directive

CHIP: Chemical Hazard Information and Packaging Regulations

CIA: Chemicals Industries Associations

CIMAH: Control of Industrial Major Accident Hazards

COMAH: Control of major accident hazards

COSHH: Control of Substances Hazardous to Health Regulations

CRF: Chemicals Regulatory Forum

DETI: Department of Enterprise, Trade and Investment – Northern Ireland

DGR: Carriage of Dangerous Goods Regulations

DGSA: Dangerous Goods Safety Advisor

DSEAR: Dangerous substances in explosive atmospheres regulations

DTI: Department for Trade and Industry

EA: Environment Agency

EU: European Union

GPP: Green Procurement Plan

IBC: Intermediate Bulk Containers

IPC: Integrated Pollution Control

ONS: Office for National Statistics

PCC: Pollution Prevention and Control

PWR: Packaging Waste Regulation

RIDDOR: Reporting of Injuries, Diseases and Dangerous Occurrences Regulations

SCM: Standard Cost Model

SEPA: Scottish Environment Protection Agency

SHE: Safety, Health and Environment

SIC: Standard Industrial Classification

VOC: Volatile Organic Compound Regulations (Solvent Emissions Regulations & Paints Directive)

Executive Summary

The DTI's Chemicals Unit commissioned this study on behalf of the Chemicals Regulatory Forum (CRF). The study was directed by a Steering Group comprising representatives of the DTI, Defra, the Cabinet Office, and three trade associations: the British Aerosol Manufacturers' Association (BAMA), the British Coatings Federation (BCF) and the British Association for Chemical Specialities (BACS).

The main tasks set out in the Terms of Reference (ToRs) were the following:

- To estimate the cost of compliance with current SHE regulations in excess of the minimum costs necessary to ensure current levels of protection; and,
- To solicit proposals for reductions in the cost of compliance with current SHE regulations, while maintaining current levels of protection.

The study also outlines, in Annex 2, a study toolkit describing how other researchers could replicate and use our methodology in future studies for other sectors or the economy.

Methodology

Information has been gathered through in-person interviews with representatives of 48 different sized firms, gathered from a wide range of sub-sectors and trade associations. The objective of using personal interviews was to engage actively with representatives of firms on the relevant issues while minimising the burden on firms that participation in the study created.

In this study the cost of regulation is computed by analysing the total and excess costs of complying with current SHE regulations. Total compliance cost is defined as the cost compared to a situation of no regulation. Excess compliance cost is defined as the additional unnecessary expenses incurred over the minimum necessary to achieve the same level of SHE protection (hence eliminating excess costs should deliver the same SHE goals, while elimination of total costs could put the benefits of SHE protection at risk).

The sector of interest is "industrial coatings, aerosols and speciality chemicals" as given in the ToRs. This definition is quite broad because it defines the sector at a very high level of aggregation and includes subcategories outside the sector. For the purposes of this study, we defined the sector of interest by 4-digit Standard Industrial Classification (SIC) code matching the sectoral coverage specified in the ToRs.

Results

The results are based on the responses of a relatively small sample of firms – many of which were unable or unwilling to value correctly the costs of regulation which they incur – and the use of data at a very high level of

aggregation which limited the precision of the definition of the sector. This creates some uncertainty surrounding our estimates of the total and excess costs of current SHE regulation.

In this study, the average total cost of compliance with SHE regulations for the industrial coatings, aerosols and speciality chemical sectors was estimated to be around 2.1% of turnover. As for the excess cost of regulation, firm representatives estimated that the unnecessary or excess cost of SHE regulations was approximately 0.6% of turnover on average.

Estimates of the cost of regulatory compliance for the entire industrial coatings, aerosols and speciality chemicals sectors have been obtained using a weighted average by turnover category to take account of the size distribution of the sector.

It was found that compliance costs were only roughly constant across firms of all sizes, and the weighted estimated total cost of compliance for the sector is 1.20% of turnover, or £278m per year[1]. The weighted excess cost of regulation is 0.38%, or £87.4m per year. In policy terms this suggests that, based on the assumptions made in this study, some £87.4m per year could be saved each year without detriment of SHE benefits and goals through the better design and implementation of current SHE regulations.

A further interesting result was that, by asking firms to think of the cost of compliance with regulation as the cost of activities they would not undertake were regulation not to exist, their estimates of the cost of regulation fell. This was because many claimed that their firm would carry out most of the tasks prescribed by regulation even if they were not forced to by law, in some cases for insurance purposes.

Sources of excessive cost of regulatory

We asked interviewees to break their estimates of excess cost down into different components. The respondents found that excess costs are particularly of 3 types:

- Staff time, typically spent reading and understanding regulations and guidance notes, dealing with inspectors, and conducting risk assessments;
- Changes to labels after reclassifications of chemicals, which in some cases required expensive new software; and,
- Changes to products, particularly after reclassifications of chemicals, such as changes to CHIP.

The regulations most frequently cited as creating excess compliance were the Packaging Waste Regulations (PWRs), COMAH and the Biocidal Products Directive/Regulations.

[1] Total turnover in the industrial coatings, aerosols and speciality chemicals sector, as defined in this study, was some £23,154m in 2004 (Source: Annual Business Inquiry (ABI), Office for National Statistics (ONS).

Benefits of regulation

We also asked interviewees if SHE regulations had benefited their firms. The main benefits of regulation that interviewees cited fell into the following five main groups:

- Improving SHE performance;
- Improving the efficiency with which firms deal with waste;
- Benefits of visits from regulators;
- Improving firms' reputations with consumers and the general public; and,
- Forcing firms to analyse their processes systematically.

Proposals for better implementation of current regulation

Interviewees made many recommendations for improving regulation. The nine most common recommendations across interviewees were:

1) Clearer, more concise and timelier guidance on the requirements of regulations;
2) Regulators should keep industry informed of future changes to regulations;
3) Make information collection from firms more efficient;
4) Make inspections more efficient;
5) Reduce duplication of policies across regulators;
6) Make inspection and enforcement more risk-based;
7) Make charging for inspections fairer;
8) Relax regulatory requirements for 'trivial' risks; and,
9) Ensure that inspections take account of the requirement in SHE law placing responsibility on individual employees.

Proposals for changes to regulation

Respondents indicated the following as the main proposed changes to the structure of regulations:

1) Integrate the large number of separate SHE regulations into an overall regulatory regime and ensure that they are consistent across the UK;
2) Replace multiple site permits with consolidated single site permits;
3) Create a single regulator to enforce the single site permits;
4) Tailor regulations more closely to risks;
5) Make better use of voluntary actions and learn from industry experience;

6) Improve the effectiveness of communication of risk to consumers and industry customers;

7) Develop central registers of information on companies to ensure that regulators are aware of all companies subject to regulation;

8) Create a hierarchy of laws so that industry can apply a single law for products that fall under several different regulations;

9) Ensure consistency between regulation in across the UK;

In terms of specific existing regulations, respondents proposed to:

1) Improve consistency between different regulations;

2) Simplify the Packaging Waste Regulations;

3) Reduce requirements for registration and testing of products under the Biocidal Products Directive;

4) Remove the requirement on firms to research the geology beneath their sites under IPPC. Instead, require experts in the EA to instruct firms on the geology of ground underneath sites, based on information available to them, and any concerns this causes;

5) Amend the European Commission's Green Procurement Plan;

6) Under the Hazardous Waste Regulations and CHIP, de-classify items as 'hazardous' if these pose a trivial risk to public health or the environment; and,

7) Under landfill regulations, permit landfill disposal or incineration of empty sacks that have contained toxic materials.

Proposals for changes to the process of producing regulations

Some interviewees argued that changes to the political process were required to prevent what they saw as an 'avalanche of regulation' that caused ongoing problems for their firm. Their proposals focussed on:

1) Legislators to think carefully what new regulations would add to existing ones;

2) Legislators to consider the impacts of regulations along the supply chain;

3) Legislators to avoid changes that would require reclassification of chemicals unless well justified by safety gains;

4) Where changes in classification are required, ensure these are 'stacked up' and thus only required every two years or so;

5) UK legislators to consider more closely whether UK implementation of EU regulations is stricter than in the rest of the EU and to consider the cost-benefit consequences of this situation for the UK; and

6) Examine the value of assumptions used in cost-benefit assessments of regulations.

1 Introduction

The DTI's Chemicals Unit commissioned this study on behalf of the Chemicals Regulatory Forum (CRF). The study was directed by a Steering Group comprising representatives of the DTI, Defra, the Cabinet Office, and three trade associations: the British Aerosol Manufacturers' Association (BAMA), the British Coatings Federation (BCF) and the British Association for Chemical Specialities (BACS).

This study is part of the UK government's Better Regulation agenda. The government's objective in adopting this agenda is to reduce the cost of compliance with regulatory law while maintaining current regulatory outcomes.

As the report of the Better Regulation Commission (2005) states, the government believes that regulation of industry has both costs and benefits. In this respect, there may be a way to make regulation more efficient, so that the costs are reduced while the benefits are maintained.[2]

The title of the present study refers to the *cumulative impact* of regulation. This is because it is often difficult to measure the cost or impact of single regulations. In some cases, compliance with one regulation will mean that the requirements of another are met. In other cases, different regulations may impose contradictory requirements on firms.

A further important issue for the context of this study is that much regulation relevant to the chemicals sector originates in the EU. The UK government cannot independently amend EU law, but can ensure that it is implemented and enforced consistently within the UK.[3]

This study also outlines, in Annex 2, a study toolkit describing how other researchers could replicate and use our methodology in future studies for other sectors of the economy.

1.1 Background

In recent years the UK chemicals industry has expressed concern about the cost it faces in complying with regulatory requirements.

[2] The Better Regulation agenda emphasises the measurement of the excess cost of compliance with regulation for two reasons. First, before responding to any perceived problem, it is sensible to have an idea how large it is. Second, the government wishes to set quantitative targets for reduction in the excess or unnecessary cost of regulation. The use of such targets provides a transparent mechanism for monitoring.

[3] Of some relevance to this study is the concern that stricter regulation in the UK than in other countries discourages chemical firms from investing in the UK. However, the current study does not collect data on the regulatory environment in countries besides the UK. Furthermore, some measures to make the UK a more attractive country in which to invest in chemical plants could reduce the level of health, safety and environmental protection. This would contradict the goals of the government's Better Regulation agenda.

The UK government has also been concerned with the effect of regulation on the cost of doing business in the UK relative to other countries. The UK government's ability to change regulations that apply to the chemicals industry is limited, however. Most of the relevant legislation originates from the European Commission and, once it has been approved, the UK cannot change it unilaterally.

In addition to pursuing a better regulation agenda within the EU, the UK government's recent efforts to reduce the cost of regulatory compliance for firms focus on better ways of implementing and enforcing existing law.[4]

To reduce the problems identified by industry and government research, the UK government has also started a programme of measuring the cost that regulation imposes on business and setting targets for reductions in this cost. Measuring the cost of regulation and the degree to which this can feasibly be reduced raises various methodological challenges.

1.2 Objectives of the study

The main tasks required in the Terms of Reference (ToRs) were the following:

- To estimate the cost of compliance with current SHE regulations in excess of the minimum costs necessary to ensure current levels of protection, and;

- To solicit proposals for reductions in the cost of compliance with current SHE regulations, while maintaining current levels of protection.

The ToRs specified that the study should examine the cost of compliance with *current* SHE regulations. This scope excludes proposals that are not yet law in the UK, such as the EU's proposed REACH regulation.

It should be noted that although some firm representatives commented on regulations in other fields these have been omitted from the current report, so as to focus on SHE regulation only.

In addition, the restriction of the study to regulatory policy means we omit some comments interviewees made about environmental taxes such as the landfill tax and climate change levy. We also omit comments about government spending programmes, such as those administered through the Carbon Trust.

[4] For example, in its examination of implementation, the Hampton report (Reducing administrative burdens: effective inspection and enforcement, HM Treasury 2005) found problems of insufficient risk basing of enforcement and duplication and overlap of responsibilities between regulators. It recommended that the principle of risk assessment be entrenched in all aspects of regulatory enforcement and that 31 national regulators be consolidated into 7 bodies.

1.3 Methodological approach

Measuring the cost regulation imposes on business is difficult because most firms keep data neither on the "cost of regulation" nor the degree to which this cost exceeds a plausible minimum cost.

The Standard Cost Model proposed by the Better Regulation Task Force[5] recommends measuring the administrative burden of all regulation as the cost of employees' time plus any external costs involved with meeting each information requirement set out by regulation combined with the frequency with which such requirements must be met (the report also calls for more investigation into methods of measuring the cost of regulation).

In this context, the study was designed to elicit both estimates of the cost of current regulation and proposals for reduction of this cost, and to explore a methodology for measuring the cost of regulation that could be used to assess this cost in other sectors of the UK economy. As will be seen further below, we adopt an approach to measuring the cost of regulation that is considerably broader than the Standard Cost Model.

Survey exercise

Information has been gathered through in-person interviews with representatives of 48 firms, across a wide range of sizes (a copy of the questionnaire used is provided in Annex 1).

The objective of using personal interviews was to engage actively with representatives of firms on the relevant issues while minimising the burden on firms.

Because of the small sample used, there could be some uncertainty surrounding the estimates of the total and excess costs of regulation.

Measuring the cost of regulatory compliance

The project Steering Group encouraged the team to interpret the cost of compliance broadly, to include not only costs of actions to meet the requirements set in regulations, but also costs of learning about regulations.

This decision was taken to ensure that the report did not neglect any effects of regulation that were particularly costly to firms. Other types of information, though not the focus of the study, were of interest to the Steering Group. These included:

- Firms' views on how current SHE regulations might be improved (while maintaining current levels of protection),
- Firms' cost of fully understanding and familiarising themselves with new regulatory proposals which are not yet law, and;

[5] Better Regulation Task Force (2005): *Regulation–Less is More*.

- Firms' views on the benefits that regulations bring or had brought to their firm and to society.

An important element of the study is the definition of the costs of regulation. We asked interviewees to estimate both the *total cost* and the *excess cost* of compliance.

- The total costs are the costs of complying with SHE regulations. Therefore it is the cost compared to a situation with no regulation.
- The excess costs are the additional unnecessary expenses incurred over the minimum necessary to achieve the same level of SHE protection.
- Note that eliminating excess costs should deliver the same SHE goals, while elimination of total costs could put the benefits of SHE protection at risk.

The separation of policy and administrative costs is an important aspect when analysing the costs of regulation. Policy costs are essentially viewed as the costs of meeting the policy objectives. Administrative costs usually arise from familiarisation with the requirements, monitoring and enforcement, proving compliance etc.

While both types of costs have been included, the separation between administrative and policy costs has not been possible in this study. We have, however, included a breakdown of the unnecessary costs of regulation. As a rough indication, one could use staff cost as measure of administrative cost (in general staff time would largely count as administrative cost, although some could be classified as a policy cost).

Definition of sector

The sector of interest is "industrial coatings, aerosols and speciality chemicals" as given in the ToRs. This definition is quite broad because it defines the sector at a very high level of aggregation and includes subcategories outside the sector. For example, the ToRs list "SIC 28–Can makers" as part of the sector, whereas the code SIC 28 is a much wider class, with no sub-class entitled "Can makers".

For the purposes of this study, we defined the sector of interest by 4-digit Standard Industrial Classification (SIC) code matching the sectoral coverage specified in the ToRs. The SIC codes used in this study are listed and described in Table 1.

Table 1: Definition of the sector used in this study

Sectors in ToRs	Sectors used
(i) Industrial Coatings (including powder coatings) and decorative coatings (not printing inks) as represented by SIC (2002) 24.30/1 but only the companies dealing in wood finishes, high performance, general industrial and decorative. (ii) Aerosols: SIC 28 – Can makers SIC 25 – Valve/gasket makers SIC 24 (or 74) – Contract fillers SIC 24 – Fillers/marketers, and (iii) Speciality chemicals: SIC 24.14 – Other organic chemicals SIC 24.51 – Soap & detergents, polishes etc. SIC 24.66 – Other chemical products SIC 24.13 – Other inorganic basic chemicals	SIC 2412: Dyes and pigments SIC 2413: Other inorganic basic chemicals SIC 2414: Other organic basic chemicals SIC 2430: Paints, print ink & mastics etc. SIC 2451: Soap & detergents, polishes etc. SIC 2466: Other chemical products not elsewhere classified SIC 2872: Light metal packaging

We should note that within each of the 4-digit SIC categories there are some activities outside the ToRs (for example, SIC code 24.30 includes "printing inks"). Because we have not been able to get a narrower definition of subsectors, inclusion of all (rather than the relevant parts of each SIC code) may serve to overestimate the total and excess cost of regulation.

In few cases, the range of activities undertaken by the interviewed firms was wider than the specification in the ToRs. This was because firms operate in a wide range of SIC activities.[6]

Interestingly, we found that similar regulations, such as COMAH, the Packaging Waste regulations, and the Carriage of Dangerous Goods regulations were of concern to interviewees both inside and outside the sector defined in the ToRs.

Allocation of firms to industries

Interviewed firms have been classified according to their SIC code.

To identify such codes we used the FAME database and Companies House records. For the majority of firms, both databases identified firms within the same sub-sector. In the cases where both sources led to different SIC codes the code within the ToRs was used. In a few remaining cases, the SIC code revealed a sub-sector outside the ToRs.

For five firms Companies House listed up to two SIC codes inside the ToRs per firm. In these cases, companies were contacted by phone to corroborate

[6] This was particularly the case for BAMA members, perhaps because no 4-digit SIC code corresponds closely to aerosol manufacture. Some of the firms suggested by Scottish Enterprise had SIC codes outside the specified range. In the case of large multinationals, while some sub-sections of the firm may produce aerosols or specialty chemicals, the Companies House website does not list such a sub-section of the firm, only a higher level such as a holding company.

their sub-sector. If firms operated in more than one sector a share of total turnover was allocated to the sub-sector with larger turnover.

Robustness of the estimated costs

In this study we have presented a methodology which attempts to estimate as accurately as possible the total and excess costs of SHE regulations in the industrial coatings, aerosols and speciality chemicals sector. However, because of certain assumptions and limitations of our approach, it is possible that our estimates do not reflect the true costs of regulation.

First, interviewees may not have valued correctly the costs of regulation which they incur. On the one hand, they may have had an incentive to exaggerate the costs that regulation impose, which we have little means of checking. On the other hand, the lack of willingness of some interviewees to estimate a specific numerical value on the costs of particular activities may serve to underestimate the total and excess costs of regulation.[7] For example, some interviewees stated that various tasks took some fraction of an employee's time, without providing an estimate of either this fraction or the relevant employee's salary. A further source of uncertainty was the different perceptions and valuations of the directors and SHE managers interviewed in the study as to the relative costs and benefits of current SHE regulation.

Second, our calculations are based on data at a high level of aggregation. In this study, we have been restricted to defining the sector of interest at the 4-digit code level. Since this has meant including sub-sectors which fall outside the scope set out in the ToRs, our results may be overestimates of the total and excess cost of regulation. Furthermore, we did not have available turnover data on the relevant SIC codes broken down by firm size which meant that it was not possible to capture perfectly in the grossing up exercise differences in the cost of regulation (as a share of turnover) both across the relevant SIC codes and firm size bands.

Third, the results are based on a small sample of firms implying that there is greater uncertainty surrounding our estimates of the cost of regulation than if they had been based on a relatively larger sample of firms. As a result, the actual total and excess cost of regulation may be higher or lower than what we have reported here.

[7] To maintain the realism of the figures, we drop from our sample those interviews where the interviewee made comments along the lines that "the cost of regulation is large but unquantifiable, one example being the following £10,000". In such cases, we judged that recording the cost of compliance as £10,000 would create a severe downward bias in our results.

2 Results

This section describes the firms and personnel interviewed. The team conducted 48 interviews, including 10 in the pilot study.[8]

The interviewees were located geographically as follows: England 42, Wales 1, Scotland 5, and Northern Ireland 1. The distribution of the sample was random. Scottish Enterprise and the Chemical Industries Association in Scotland actively encouraged Scottish firms to participate. The DETI in Northern Ireland was also very helpful in supplying the names of chemical firms in Northern Ireland, but the response rate of these firms was lower.

2.1 Descriptive analysis of the sample

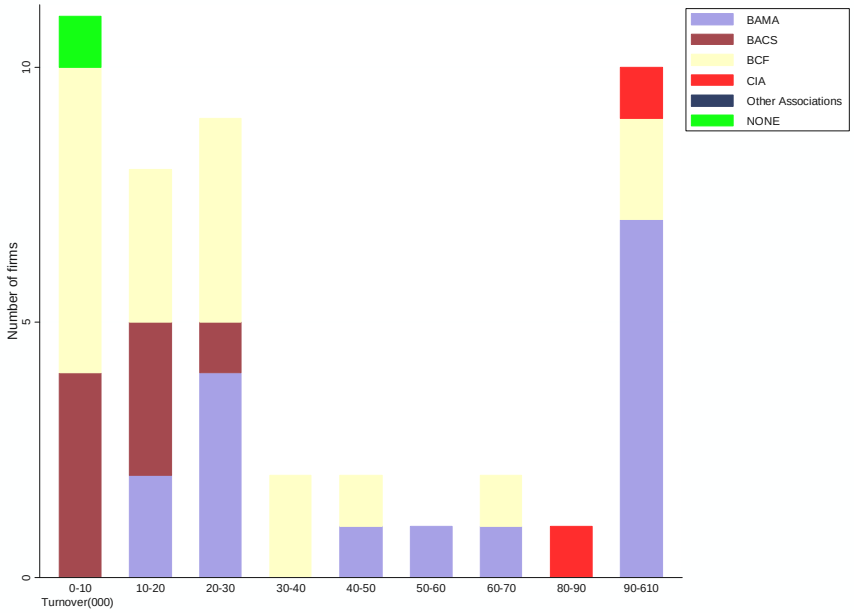
Those interviewees who provided numerical estimates of the cost of regulatory compliance were mostly from smaller firms. This is because representatives of the larger firms could not estimate either the UK cost of regulatory compliance or a UK turnover. Of the 39 firms that quoted a total cost of regulation, turnover was below £5m in 10 cases, below £50m in 32 cases, and the highest turnover was £600m.[9]

Figure 1 shows the 45 quoted turnovers, and the trade association membership of the firms. The figure shows that the smaller firms were mostly members of BACS and the BCF, while several BAMA members were larger firms.

[8] Two firms withdrew from interviews at a late stage in the study, leaving the team short of the envisaged 50 interviews. Other firms we contacted after the withdrawal of these firms were not willing to participate in the study.

[9] The firm reporting a turnover of £600m was a division of a very large multinational with a global turnover of billions of pounds. Thus, we find the turnover figure of £600m plausible. It is not clear, however, whether this firm fitted in the definition of the sector in the Terms of Reference. Although the firm is a member of BAMA, the only SIC code Companies House lists for this division is 7499, 'Non-trading company'.

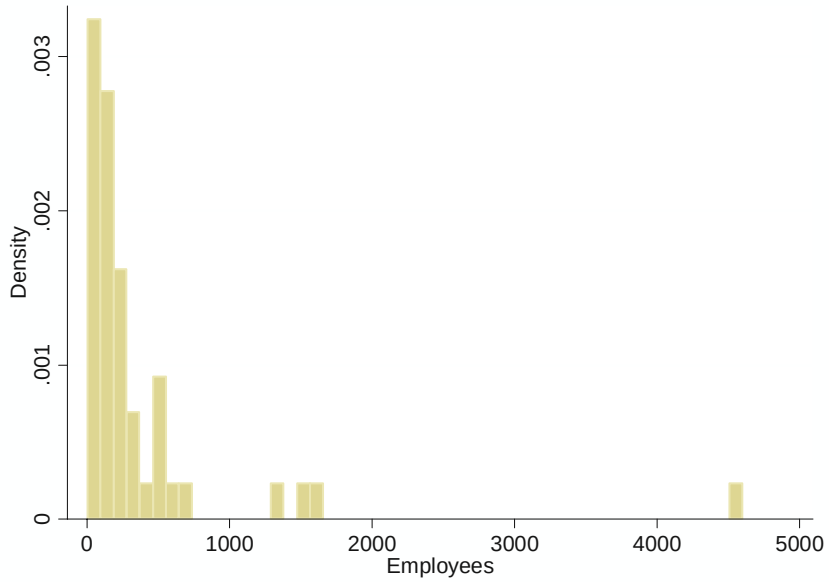
Figure 1: Frequency of firm turnover and trade association membership



Note: Trade associations are: the British Aerosol Manufacturers' Association (BAMA),, the British Association for Chemical Specialities (BACS),, the British Coatings Federation (BCF),, the Chemical Industries Association (CIA).. Some interviewees could not quote a UK turnover for their firm or division. This included several large firms with world turnover in excess of £1billion.

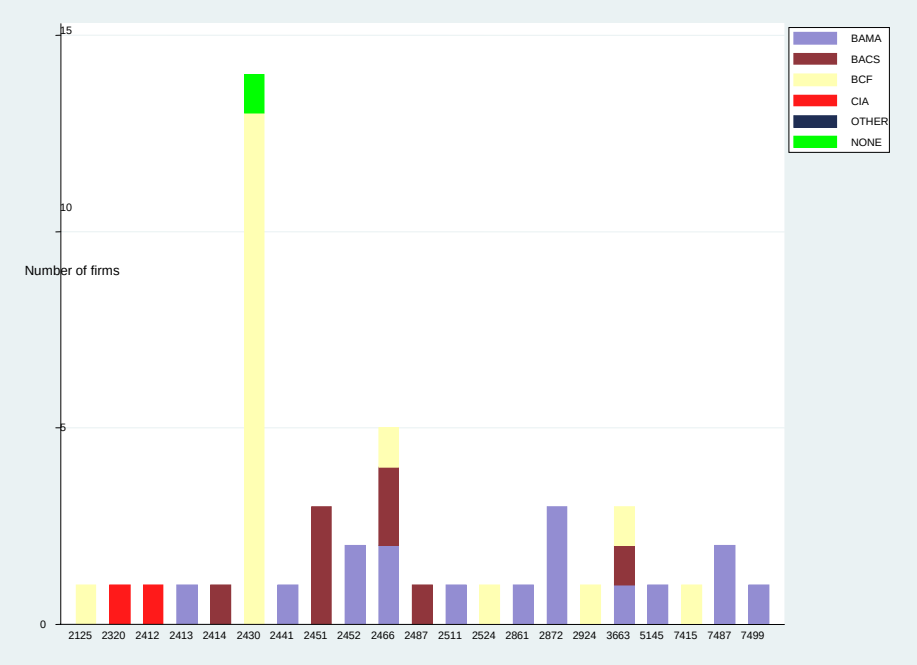
The size distribution of the sample can also be seen analysing the firm's number of employees (Figure 2). We can see that the bulk of firms have fewer than 500 employees, with some larger companies having around 1500, and the largest approximately 4500 workers.

Figure 2: Histogram of firms' number of employees



An indication of the activities undertaken by the firms is given by their SIC codes.[10] Figure 3 shows the firms' SIC codes and the trade association membership for the 48 firms in our sample.

Figure 3: Frequency of firms' sectors and trade association membership



Note: Trade associations are: the British Aerosol Manufacturers' Association (BAMA), the British Association for Chemical Specialities (BACS), the British Coatings Federation (BCF) and the Chemical Industries Association (CIA).

Personnel within firms

The personnel interviewed were typically SHE managers (sometimes titled regulatory affairs managers) or managing directors.

The perspectives of these interviewees tended to differ in an interesting manner. SHE managers often tended to view their main responsibility as being employee safety, rather than company profit. Thus, such managers tended to be more positive about the benefits of regulation (such managers incur particular time costs reading complicated regulations or guidance notes).

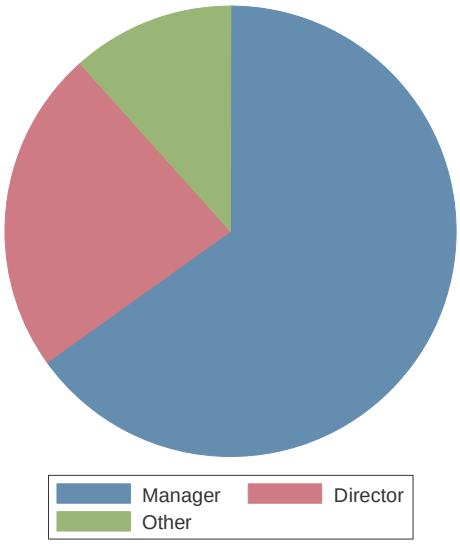
Directors tended to have a clearer sense of the effect of regulatory compliance on profit, and thus tended to be somewhat less positive about the benefits of

[10] See pg.5 for a description of how SIC codes have been obtained.

regulation. Managing directors were concerned for the safety of their employees and customers, but tended to be more confident that firms' concern for their reputations would enforce good practice in the absence of regulation.

Figure 4 below shows the composition of the sample of respondents. More than half of the interviewees occupied a managerial role within the selected firm. Among the remaining respondents, about half were "Directors" and the other half occupied "Other technical positions".

Figure 4: Job title of respondents



Note: "Managers" includes Head of Corporate SHE Division, Head of Corporate Affairs, Head of SHE Regulation, Business Manager, Technical Manager, Divisional Manager, Management System Manager, Technical Services Manager and Production Director. "Directors" include positions such as Chief Executive Officer, Managing Partner and Managing Director. "Other technical positions" include Team Leader, Technical Advisor, Industrial Chemist and Researcher.

2.2 The costs of compliance

Sector-wide costs

The results of our interviews are summarised in Table 2. The average estimate of the total cost of compliance with SHE regulations was 2.1% of turnover.

As for the excess cost of regulation, firm representatives estimated that the unnecessary or excess cost of SHE regulations was 0.6% of turnover, on average.

Table 2: Interview results on costs of regulatory compliance

Variable	No. firms reporting	Mean	Range [min, max]
Turnover (£m)	45	52.6	[0.1, 600]
Employees (number)	47	372.2	[2.5, 4600]
Payroll (£m)	20	6.5	[0.0, 42.4]
Cost of regulation (% turnover)	39	2.12	[0.1, 7.7]
Excess cost of regulation (% turnover)	29	0.57	[0, 2.9]

Source: 48 interviews conducted by LE-RPA during November 2005 – May 2006.

It was noted during the interviews that by asking firms to think of the cost of compliance with regulation as the cost of activities they would not undertake were regulation not to exist, their estimates of the cost of regulation fell. This was because many claimed that their firm would carry out most of the tasks prescribed by regulation even if they were not forced to by law, in some cases for insurance purposes.

Regulation costs by firm size

Interviewees' estimates of the total and excess costs of compliance with regulation were generally inversely related to the turnover of their firm or plant. This is shown in Table 3, which shows the average cost estimates of firms within several turnover bands.

Table 3: Cost of regulatory compliance by firm size

	0-10	10-20	20-40	40+
Total cost of regulation as % turnover (number of firms reporting)	3.27 (12)	1.90 (8)	1.97 (11)	0.84 (8)
Excess cost of regulation as % turnover (number of firms reporting)	0.98 (9)	0.33 (7)	0.57 (6)	0.30 (7)

Source: 48 interviews conducted by LE-RPA during November 2005 – May 2006.

The estimated total cost of regulation falls almost uniformly as a share of turnover as turnover rises (as the first row of Table 3 shows). This would be consistent with the existence of compliance costs that are roughly constant across firms of all sizes. Costs of this type that our interviewees emphasised included administrative costs, such as learning about new regulations, and policy costs, such as buying new software and writing new safety data sheets to comply with changes to classification systems, for example under CHIP. The cost of writing new safety data sheets will be fixed for any volume of supply of any one product, though larger firms may supply more products. The estimated excess cost of regulation, as a share of turnover, also fell with

turnover, but less dramatically than the total cost. One reason for the more gradual fall is that larger firms were more likely to be covered by COMAH, which some considered to cause unnecessary costs. Larger firms also reported more excess costs related to inspections, while small firms were inspected less frequently.

This reflected that large firms typically felt they had strong SHE practices. Therefore, large sites might present a large hazard (one could imagine a major accident occurring there) but little risk (because existing systems make the probability of such major accidents very small).

2.3 Cost of compliance by sub-sector

We show our interview results on the cost of compliance by the SIC codes of the interviewee's firm in Table 4 below. A big share of respondents could be traced back to SIC code 2430, "Manufacture of paints, print ink & mastics etc." The estimates of total and excess compliance costs by firms in this SIC code were above the sample-wide averages of 2.1 and 0.6% respectively. This is, however, partially explained by the small size of these firms.

Table 4: Average estimated cost of compliance as a share of turnover, by SIC code.

	Cost of compliance		No. of firms estimating costs	
SIC code	**Total**	**Unnecessary**	**Total**	**Unnecessary**
2412	1.11	0.31	1	1
2413	3.06	--	1	0
2414	0.93	--	1	--
2430	3.05	0.99	14	11
2451	2.21	0.42	3	2
2466	1.38	0.15	4	4
2511	1.06	0.01	1	1
2872	1.46	0.14	3	3
Other*	1.44	0.51	10	7
None	3.03	--	1	0
Average	**2.13**	**0.57**	**39**	**29**

Note: * Firms with SIC codes outside the terms of reference of this study.

2.4 Costs of compliance estimates for the sector

Using our sample estimates, our next aim is to obtain estimates of the cost of compliance of regulation for the whole sector. In essence, this means translating our sample results into an estimate of the cost of regulatory

compliance across the entire industrial coatings, aerosols and speciality chemicals sectors in the UK.

We observe that the distribution by turnover of firms in our sample differs from the distribution of the total sector. For example, 76.8% of firms in the sector have turnovers higher than £40m and 8.2% of the firms between £20m and £40m. This compares to 20.5% and 28.2% for the £40m+ and £20-40m groups in our sample (as the first and second row of Table 5 shows).

The observations in the sample need to be re-weighted to account for the population proportions. Each observation is weighted by the weight of each turnover group to reflect that there are more companies in the £40m+ group than in the £20-40m group. The weights are obtained for each turnover category using the ratio of ABI population over sampled frequencies (as shown in the third row of Table 5).[11] The total and excess cost of compliance are computed as a weighted average by turnover category. This is explained more fully in Annex 2.

Table 5: Derived weights for total (excess) cost of compliance, by turnover (£m per year).

	0-10	10-20	20-40	40-+	Total
Sample*	30.8 (31)	20.5 (24.1)	28.2 (20.7)	20.5 (24.1)	100 (100)
Population**	8.3 (8.3)	6.7 (6.7)	8.2 (8.2)	76.8 (76.8)	100 (100)
Weights	0.27 (0.27)	0.33 (0.28)	0.29 (0.4)	3.74 (3.18)	-- (--)

Note: * 2006 data. ** 2004 data, collected from the Office for National Statistics' Annual Business Inquiry (ABI). Weights are obtained from the ratio of population/sample frequencies for each of the categories.

Once the total and excess costs of regulation of each firm have been adjusted by the weight corresponding to their relevant turnover group, a simple average is then calculated and this is multiplied by total turnover in the sector to obtain an estimate of the total and excess cost of current SHE regulations in value terms.

[11] Turnover data for 2004 are collected from the Office for National Statistics' Annual Business Inquiry (ABI). The ONS has not released turnover data by SIC code for 2005 or 2006. However, it appears likely that the sector's turnover will have grown between 2004 and 2006 due to the growth of UK GDP in those years. Turnover in SIC code 24, which contains much of the chemicals industry, grew by an average of 1.5% per year between 1995 and 2004. Thus, while turnover in the sector may have been lower in 2006 than 2004, the best guess appears to be that it was slightly higher.

Results

The weighted estimated cost of compliance is 1.2% of turnover, or £278m per year[12]. The weighted excess cost of regulation is 0.38%, or £87.4m per year (Table 6).[13]

- In policy terms, this suggests that, based on the assumptions made in this study some £87.4m per year could be saved each year without detriment to the benefits of SHE goals through the better design and implementation of current SHE regulations.
-

Table 6: Cost of regulation (weighted estimates for total sector)

	Total Cost	Excess Cost
Cost of regulation (% turnover)	1.21	0.38
Cost of regulation (£m)	278	87

Note: based on a sector turnover of £23,154 (2004). Sector comprises the following sub-sectors: "2412: Dyes and pigments"; "2413: Other inorganic basic chemicals"; "2414: Other organic basic chemicals"; "2430: Paints, print ink & mastics etc."; "2451: Soap & detergents, polishes etc."; "2466: Other chemical products not elsewhere classified"; "2872: Light metal packaging".

[12] Total turnover in the industrial coatings, aerosols and speciality chemicals sector, as defined in this study, was some £23,154m in 2004 (Source: Annual Business Inquiry (ABI), Office for National Statistics (ONS).

[13] Based on official ABI turnover data for 2004.

3 Sources of costs and benefits derived from regulation

3.1 Sources of excessive cost of regulatory

A sense of how any excessive costs of compliance with regulation arise would be useful for simplification proposals to be taken forward. We asked interviewees to break their estimates of excess cost down into different components.

Only 16 firm representatives of the 48 interviewed were able to provide a breakdown of estimated excess costs of compliance according to the components our questionnaire listed. While this response rate is low, the numbers they quoted are fairly representative of the qualitative answers we received from a larger number of firms. Table 7 summarises the quantitative breakdowns of the estimated excess cost of regulatory compliance.

These breakdowns reveal that excess costs for these 16 companies are particularly of three types:

- Staff time, typically spent reading and understanding regulations and guidance notes, dealing with inspectors, and conducting risk assessments;
- Changes to labels after reclassifications of chemicals, which in some cases required expensive new software, and
- Changes to products, particularly after reclassifications of chemicals, such as changes to CHIP.

Table 7: Breakdown of unnecessary cost of compliance

Type of cost	Percentage of total unnecessary cost
Staff salaries (typically dedicated SHE staff)	19.4
Changes to labelling	19.1
Changes to products	15.3
Other category	12.8
Other plant and process costs	11.3
Fees and charges imposed by regulator	10.1
Other time (typically time of non-dedicated staff)	8.0
External advice and testing	2.8
Equipment	1.1

Note: the 16 firms (or sub-units of firms such as plants) who gave a breakdown of the unnecessary costs of regulation had a combined turnover of £615.6m and quoted a total cost of regulation of £3.27m and a total excess cost of regulation of £1.96m.
Source: Interviews conducted by LE-RPA during November 2005 – May 2006.

The judgement that these costs were excessive implies that interviewees thought these activities made little difference to employee (or public) health and safety or to environmental protection. The main reasons why interviewees considered these activities of little benefit were the following:

- **Interviewees found regulations and guidance notes excessively long and complicated.** One example was guidance on the Solvent Emissions Regulations, which is 67 pages long.
- **Interviewees also wanted guidance notes to be produced earlier in the lifetime of each regulation, and more direction as to which regulations were relevant to them.** Interviewees reported spending a lot of time studying regulations and guidance, sometimes only to check whether they were relevant to their firms. Small firms were particularly concerned about these time costs, as they tended to receive fewer inspector visits and had less help in interpreting regulations. It was also not economic for small firms to establish the specialist regulatory departments that many large firms have.
- **Interviewees were concerned about inconsistency in inspectors' interpretation of regulations, both between inspectors of the same agency at different locations and between different inspectors at the same plant.** This caused uncertainty over how to comply and the expenditure of additional time studying regulations to anticipate how future inspectors might interpret them.
- **A minority of interviewees commented that inspections were less efficient than they could be,** due to a lack of prior information about agendas and scheduling. They recognised that efforts had been made to

improve efficiency, but wanted all inspectors to adopt best practice in this regard.

- **Interviewees felt the reclassification of chemicals due to changes in regulations such as CHIP achieved little or no health, safety or environmental benefit.** Reclassifications could require extensive changes to labelling and safety data sheets, as well as affecting product sales, but were thought to be of little ultimate benefit. It appeared that customers were in any case unlikely to read new safety data sheets.

The regulations most frequently cited as creating excess costs are listed in Table 8. It shows that the regulations most frequently cited in this context were the Packaging Waste Regulations (PWRs), COMAH and the Biocidal Products Directive/Regulations. However, our questionnaire was not designed to break down excess costs by regulation. Thus, we cannot estimate the costs that would be saved by particular regulatory reforms.

Interviewees made three particular complaints about the Packaging Waste Regulations (PWRs). First, several interviewees argued that the regulations made excessive requirements for firms to submit data. Second, many interviewees claimed their firms had little capacity to reduce their use of packaging, partly due to the packaging requirements of transport regulations. Third, internal recycling would not reduce fees under the PWRs unless the site was a registered recycling site. Thus, interviewees felt fees payable under the PWRs were closer to a tax than an incentive to recycle material.

Table 8: Regulations interviewees most frequently as creating excess compliance costs

Regulation	No. interviews in which cited
Packaging and Packaging Waste Regulations	16
COMAH	13
Biocidal Products Directive/Regulations	11
Hazardous Waste Classification and Waste Disposal	10
Carriage of Dangerous Goods Regulations including DGSA	10
IPPC/Pollution Prevention and Control Regulations	10
CHIP/Dangerous Substances/Dangerous Preparations Directives	9
Dangerous substances in explosive atmospheres regulations (DSEAR)	7
Detergents Regulations	7
Solvent Emissions Regulations	6
Management of Health and Safety at Work Regulations	6
COSHH Regulations	5
Cosmetics Regulations	4

Note: based on responses to Questions 7 and 8; no other regulations were cited as particularly burdensome by more than two respondents

Source: Interviews conducted by LE-RPA during November 2005 – May 2006.

3.2 Benefits of regulation

We also asked interviewees if SHE regulations had benefited their firms. The majority of interviewees identified such benefits though they were typically unable to quantify these benefits, due to their intangible nature.

A minority argued that regulation was not necessary because firms' concerns over their reputation with consumers led them to act responsibly. Some also argued that their insurers would in practice force them to adopt the same practices required by regulation even in the absence of regulation. In contrast to this view, however, some interviewees at small firms were concerned that, without strict enforcement of regulation, their competitors might behave irresponsibly.

The main benefits of regulation that interviewees cited fell into the following four main groups:

- **Improving environment, health and safety performance.** Many interviewees stated that over the past 10-15 years health, safety and environmental practices within their firms had greatly improved and that the rate of accidents had declined. Most of these interviewees felt that changes to regulations had driven this improvement. Some interviewees also noted that a safer and more environmentally friendly workplace provided a variety of cost savings and productivity improvements to firms, in part through increasing employee morale.
- **Improving the efficiency with which firms deal with waste.** Some interviewees noted that restrictions on waste disposal had forced their firms to think in an organised manner about how to minimise their production of waste, ultimately leading to greater recycling and cost savings for the firm.
- **Benefits of visits from regulators**. Several interviewees felt that inspectors could direct firms to a more sensible and productive manner of solving problems rather than merely the quickest or the cheapest way. One interviewee viewed visits from experienced HSE inspectors as offering free but valuable consultancy services.
- **Improving firms' reputation with consumers and the general public.** Some interviewees noted that the chemicals industry was highly vulnerable to bad publicity and scare stories, and that the existence of a strong regulatory regime was thus helpful to their reputations, sales and ability to attract investment.
- **Forcing firms to analyse their processes systematically**. Some interviewees noted that regulations had forced them to think about processes and parts of their factories that they would otherwise have ignored. The outcome of this process was often an efficiency gain of a different type than that at which the regulation had aimed.

One interviewee argued further that there are incentives to innovate in a regulated environment. Where all producers are regulated identically, an

invention that meets regulatory requirements in a cheaper manner will be highly rewarded. However, there was concern about the potential advantage to competitors manufacturing in less well regulated countries outside of the EU. Thus, this interviewee (and many others) argued it was important to make regulations apply globally. In addition, some interviewees who were health, safety and environmental managers felt that regulations were useful in persuading directors to invest in performance improvements.

4 Proposals for better implementation of current regulation

Over the 48 interviews, interviewees made many suggestions for improvements to the implementation and enforcement of existing regulation. Between them, these suggestions apply to all the enforcing bodies – the HSE and EA/SEPA, local authorities and the fire services – though some relate more to one body than others. This section provides a more detailed and longer list of firms' proposals for better implementation and enforcement of current law.

1) **Regulators to provide clearer guidance** on what is expected of companies under regulations. This could take several forms:
   - 1.1) **Guidance notes** that are brief, simply and clearly written and available well before the regulations came into force, preferably published at the same time as the regulations. The notes should explain how each regulation will be implemented and enforced, and be consistent for each regulation or directive, with ideally one guidance note per regulation.[14]
   - 1.2) **Clear responses to enquiries as to what the law requires**. This could potentially be assisted by enforcement agencies developing separate arms to provide advice on compliance, to avoid the current situation where inspectors are unable to provide advice because of liability concerns.
   - 1.3) Regulators to adopt a **legal definition of risk assessment** and state *ex ante* what the format of risk assessment forms should be, giving examples of acceptable, standardised formats. They should also provide guidance on how far risk assessment should go, for example in relation to apparently 'trivial' risks, such as using stairs.
2) **Regulators should keep industry informed** of future changes to regulations. This could take several forms:
   - 2.1) **Creating a 'five year plan', describing both UK and EU proposals for five years into the future.** Communication with industry about the development of REACH was suggested as an example of good practice.

[14] One example of a guidance note that was described as excessively long and complicated was Defra Process Guidance Note 6/44(04) (http://www.defra.gov.uk/environment/airquality/lapc/pgnotes/pdf/pg6-44.pdf). Others included the 67-page guidance on the Solvent Emissions Directive and guidance on the Packaging Waste Regulations, Noise regulations, Carriage of Dangerous Goods/DGSA and DSEAR.

2.2) **Sending regular e-mail digests of regulatory developments to firms**, explaining what new developments were relevant to them, or provide an email alert service, for firms that pre-register to receive such a service. Directing firms to (easily locatable) details on their web sites. Digests published by industry associations were a good model, but not universally read and sometimes appeared dauntingly long and complex. One firm also commended HSE presentation to local industry forums on the focus of its activity for the coming year.

2.3) **Make regulations available for free.** For example, firms currently have to purchase copies of the ATEX regulations.[15]

3) **Make information collection from firms more efficient**. This could be achieved by:

3.1) **Removing requirements for unnecessarily detailed information from forms** (for example under the Packaging Waste Regulations) and making forms more sector-specific, so that they are easier to answer. Some respondents recognised that this might increase regulators' workload by requiring them to develop and analyse a larger number of different forms.

3.2) **Making better use of existing forms**, for example providing waste generators with a copy of the completed waste consignment note so that they can ensure that their waste has been properly disposed of, or sharing data between regulators to avoid it being collected several times.

3.3) **Making electronic forms easier to complete,** by permitting the respondent to refer to answers given elsewhere in the form. One company cited on-line filing for RIDDOR as a good example.

3.4) **Ensuring regulators respond in a timely fashion to registration processes.** One interviewee suggested the UK adopt the Australian system, where regulators were fined for failing to meet deadlines for responses. Others suggested service-level agreements with regulators.

4) **Make inspections more efficient, for example through:**

4.1) **Employing more experienced inspectors, better able to detect non-compliance.** In particular, employ more inspectors with private industry experience who can be 'poachers turned gamekeepers.' Interviewees recognised that this might require larger budgets for regulatory agencies, but thought these would be justified if detection rates of non-compliance increased.

[15] ATEX is the name commonly given to the framework for controlling explosive atmospheres and the standards of equipment and protective systems used them.

4.2) **Developing more industry-focused teams**. The HSE specialist chemicals team was seen as a good model, providing a team that understood the sector and promoting better dialogue.

4.3) **Reducing turnover of inspectors at each site** to reduce the frequency at which firms have to educate new HSE and EA inspectors about their activities. Such education can be a major time cost**.**

4.4) **Reducing the total number of inspections at large sites** through better coordination between HSE, EA/SEPA and local authorities, or even merger of these bodies. One company saw frequency of inspections as a particular issue for COMAH (although this is currently being addressed through the Regulation and Recognition project). However, several smaller firms said they rarely saw inspectors and thus were concerned that their competitors would face little risk of penalty if they failed to comply with regulations.

4.5) **More consistent interpretation of regulations by inspectors across the UK**. Some companies with very similar sites in different UK regions had experience of widely differing interpretations of the requirements of COMAH and DSEAR by inspectors. Inconsistency of interpretation was of particular concern in the context of a high turnover of inspectors. Some interviewees in Scotland argued that in the past Scottish regulators had made more restrictive decisions than their English counterparts.

4.6) **Allow simpler ways of proving compliance** and more flexibility in accepting company risk assessment formats, for example under DSEAR.

4.7) **Make the inspection process more efficient.** Two firms felt strongly that inspectors should be required to send firms schedules of visits and agendas for these visits considerably in advance. Other firms commented that HSE inspectors already did this. Some inspectors were better than others in planning inspections in advance. A role for unscheduled visits would remain, however.

5) **Reduce duplication of policies across regulators.** This would include:

5.1) **Better coordination between HSE and environment agencies** (EA and SEPA), for example over enforcement of COMAH, and between their respective departments.

5.2) There were also concerns about a lack of co-ordination and even contradiction between the requirements of HSE and EA/SEPA, local authorities and the fire service. For example, a local authority had asked one firm to locate storage tanks in its basement, while the fire service said that, if this were done, it

would rescind the company's fire certificate. The HSE had asked another company to paint its storage tanks a bright colour for safety reasons whilst the EA requested that they be painted a colour that blended into the background. One company also reported inconsistencies in relation to solvents, with HSE requiring extraction systems to protect the workforce whilst the EA opposed this because it would increase atmospheric emissions.

6) **Make inspection and enforcement more risk-based.** Several methods of achieving this were suggested:

6.1) **Focus on the highest-risk issues rather than simply paperwork.** Some respondents had experience of inspections that appeared to focus only on the detail of record keeping and form filling, rather than the HSE performance of the company. For example, one interviewee stated that his firm had undergone two detailed audits of documentation relating to packaging regulations, despite being a minor producer of packaging waste.

6.2) **Create a more consistent inspection regime across regions, sectors and firm sizes.** In particular, inspect a wider range of small firms. Companies were concerned that some firms posing a significant risk could remain invisible to the regulators. These companies often have less reputation to lose by flouting regulations. Some interviewees stated they would favour an increased budget for the HSE if this enabled it to inspect more firms and enforce the law more consistently.

6.3) **Respond adequately to firms' complaints about risks created by neighbouring firms.** Some firms claimed that regulatory bodies had failed to act on their complaints about problems or potential problems (such as fire risks) caused by nearby firms.

6.4) **Employ the principle of 'earned autonomy from inspection'** whereby firms that have performed well on past inspections are inspected less frequently in future. Some interviewees noted that this was already happening at local authority level. Some interviewees also suggested the HSE use a rating system of firms' compliance to establish which firms merited greater or lesser attention. Apparently the HSE has mooted such a scheme before, but not employed it. We understand that this approach is being tested through the Regulation and Recognition project.

6.5) **Allocate more resources to policing the content of imported preparations and products.** Some interviewees were sceptical that it was possible to police the content of imported goods as strictly as those manufactured in the UK. But if regulation applies to goods produced in the UK but not imports, the chemicals industry would have an incentive to relocate overseas.

6.6) **Make penalties for non-compliance proportionate to the risk of re-offence.** One interviewee stated that an accident had caused his firm to recognise a problem it was not previously aware of, and that there seemed little point in penalising the firm for this lack of foreknowledge after the event.

6.7) **Link the stringency of enforcement to firms' efforts to comply.** For example, one respondent suggested regulators institute a moratorium on enforcement actions against firms making a genuine effort to comply.

7) **Make charging for inspections fairer**, for example by:

7.1) **Requiring regulators to explain and justify any increases in fees**, particularly at rates above the cost of living. Interviewees did not seem aware that the EA publishes supporting documentation at national level.

7.2) **Place a cap on fees that could be charged to any one company.** Some interviewees noted that for inspectors to be able to visit at will and charge for their time, regardless of whether the company was experiencing problems or managing risks poorly, was not a practice possible in the commercial world and one felt it left 'a bad taste in the mouth.'

7.3) **Review the basis for charging per inspection.** There was concern that charging for inspections (for example of COMAH by the HSE and EA) could provide an incentive for more inspections than was necessary on a risk basis.

8) **Relax regulatory requirements for 'trivial' risks**, for example:

8.1) **Under the Hazardous Waste Regulations, remove the requirement for a waste treatment license for the use of a compactor for empty containers such as paint tins.** Some interviewees believed the EA's definition of compacting as waste treatment created costs that discouraged firms from undertaking this activity. However, compacting empty containers would save on lorry trips and would thus be environmentally beneficial.

8.2) **Review the requirements on exam taking for Dangerous Goods Safety Advisors.** At present, all DGSAs have to take exams in handling all types of dangerous goods every five years. However, many firms use only a subset of the goods on which the exams are based. Thus, it would be more appropriate for the DGSAs to take exams covering only the goods potentially relevant to their firm.

9) **Ensure that inspections take account of the requirement in SHE law placing responsibility on individual employees.** While SHE law states that employees have responsibility for their own safety and that of people around them, some interviewees argued that in practice employers were held liable for most of employees' errors. There was a

concern that in general it was too easy for employees to sue their employer and win, even when individual employees had been demonstrably irresponsible, and that in consequence a culture of spurious claims was developing. One interviewee expressed concern that the HSE was providing guidance to employees on how to make claims.

10) **Changes to enforcement at the EU level.** Interviewees also made suggestions for changes to enforcement at the EU level. Several argued that action should be taken at EU level to ensure consistency in enforcement of EU laws (to UK levels) throughout the EU. Also, a representative of a multinational argued that interpretation of EU laws should be made more consistent across EU countries. This would avoid current problems, such as customs officers stopping truckloads of product at intra-EU national borders because they interpret the ADR[16] differently from UK regulators, and prosecutions of managers in one country for activities considered legal elsewhere.

[16] The *European Agreement concerning the International Carriage of Dangerous Goods by Road* (ADR) was made at Geneva on 30 September 1957 under the auspices of the United Nations Economic Commission for Europe (UNECE). It entered into force on 29 January 1968 and has been implemented in the EU through Directive 2003/28/EC.

5 Proposals for changes to regulations

Many interviewees were more enthusiastic about suggesting changes to regulations than about proposing improvements to the way current regulations are implemented. For example, the representative of one multinational described changing the implementation of current law as 'merely tinkering around the edges' of current regulatory problems.

We encouraged companies to be wide-ranging in their suggestions. Consequently, not all of their suggestions will be equally practicable or within the power of the UK to implement unilaterally. Nevertheless, they provide a useful indication of areas where interviewees believe that there is significant potential to improve regulations whilst maintaining current SHE outcomes.

Interviewees' proposals for changes to current regulations included the following, where opinions given are those of interviewees:

5.1 Changes to the structure of regulations

1) **Integrate the large number of separate SHE regulations into an overall regulatory regime and ensure that they are consistent across the UK.** Currently, there are too many different regulations with the same broad objectives and using many of the same approaches in an un-coordinated way. There are differences in the testing approaches and even in basic definitions (such as 'placing on the market') that make compliance very difficult. One interviewee cited recent changes to the Fire Regulations as a good example of this consolidation process, while another cited the implementation of the Solvent Emissions Directive within the UK PPC regulations.

2) **Replace multiple site permits with consolidated single site permits** covering all aspects of regulation – planning and fire control as well as pollution control and safety. The requirements would be based on an overall assessment of the risks posed by the site, and any new additions to requirements would be assessed in terms of their overall impact.

3) **Create a single regulator to enforce the single site permits**. This would mirror the approach to SHE management in the leading companies, which have a single, management system incorporating policy, objectives and targets, audit and reporting. Ideally, the regulator should be sector-focused, allowing for the development of a greater understanding of the sector and better dialogue between regulators and industry.

4) **Tailor regulations more closely to risks** rather than hazard, avoiding the situation where sites are subject to stringent requirements because they store or use materials classified as hazardous, regardless of the triviality of the risk. This could be achieved in several ways, including:

4.1) Permit a 'sliding scale' of requirements on firms under COMAH and PPC, or permit a 'triviality' exemption, as under IPC. This would avoid a situation where the full weight of requirements are applied, even though risks are minimal;

4.2) Re-examine the threshold for inclusion of facilities under regulations, in particular the threshold for 'environmentally hazardous' substances under COMAH.

5) **Make better use of voluntary actions and learn from industry experience**. This could include:

5.1) Make more use of voluntary agreements with industry associations, backed with government enforcement to avoid 'free riders' (as, for example, with the Dutch 'Covenants' system).

5.2) Focus more on setting performance targets to be achieved, rather than prescriptive regulations, and ensuring that management systems are effective, as these are the key to preventing risky situations arising. One interviewee suggested that the government should endorse the environmental and health and safety management system standards (ISO 14001 and ISO 18000), and make a single set of inspectors, with industry experience, responsible for checking compliance with these standards.

6) **Improve the effectiveness of communication of risk** to consumers and industry customers:

6.1) Current systems of labelling of consumer products (for example under CHIP, the VOC regulations and the Detergents Regulation are confusing and do not provide the information consumers require to use them safely.

6.2) Similarly, safety data sheets would be much more useful to companies and their employees were they shorter and clearer than at present, and if there were fewer requirements to send new safety data sheets to customers when minor changes were made, due for example to changes to CHIP.[17]

7) **Develop central registers of information on companies** to ensure that regulators are aware of all companies subject to regulation and to provide a central point of information. Suggestions included:

7.1) **Require all companies in high-risk sectors to register**, providing basic details that would enable regulators and others to determine whether they come within the scope of different regulations. This could be linked to existing systems, for example VAT registration.

[17] To test customers' use of safety data sheets, one interviewee reported having sent 50 data sheets to customers with a note on them saying that if they rang the response number they would receive £10. No responses were received. The interviewee saw this as evidence that customers weren't reading the data sheets.

7.2) **List chemical firms' regulatory standing and the chemicals they have registered on the Companies House website** to pre-empt enquiries from customers and others on the firm's precise regulatory standing. [18]

8) **Create a hierarchy of laws so that industry can apply a single law for products that fall under several different regulations.** For example, if a product such as alcohol gel for cleaning hands in hospitals is both a medical and a biocidal product, establish a hierarchy so that it only has to comply with medical regulations (the most stringent). Currently, where different laws are relevant, there is no hierarchy, so firms have to apply all the relevant regulations, even though they may be contradictory.

9) **Ensure consistency between regulation throughout the UK** so as to avoid competition between firms in the separate jurisdictions based on differing regulations.

5.2 Changes to specific regulations

10) **Improve consistency between different regulations.** For example**:**

10.1) Coordinate COMAH and environmental regulation better. The classification of a site as a COMAH site can trigger new requirements for environmental protection not faced by adjacent sites that arguably pose higher environmental risks but are not subject to COMAH. Also reduce duplication between COMAH and the Planning Hazardous Substances Regulations, which apply in Scotland.

10.2) Reduce contradiction between transport regulations and Packaging Waste Regulations (PWRs). In some cases the transport regulations require the use of additional packaging for the transport of aerosols and paints, but the PWRs then penalise this use of packaging.

10.3) Integrate classifications of chemicals, for example between CHIP and the Carriage of Dangerous Goods Regulations (CDGRs), and also between the Dangerous Preparations Directive and the CDGRs. Some interviewees noted that certain chemicals were classed as flammable under CHIP but non-flammable under CDG, and similarly some were toxic under CHIP and non-toxic under CDG. This was very confusing and time-consuming. Others noted that the reclassification of chemicals could create further cost by trigging the application of other regulations, such as COMAH, and affecting product sales.

[18] The proposed EU REACH Regulation would develop a central register of chemicals at EU level.

10.4) Remove the requirement for ingredient data sheets under the Detergents Regulation, instead integrating these requirements into CHIP.

11) **Simplify the Packaging Waste Regulations.** Many respondents suggested there was a need to amend these regulations, which the UK could do unilaterally. Several interviewees stated that the UK implementation of the Packaging Waste Directive was much more complex that that in other EU Member States. Two options were suggested. The first would be to simplify the information requirements under the Regulation. The second would be to replace the current system with a levy on packaging materials at the point of purchase. This would be simpler and would provide a clearer incentive to minimise packaging use.

12) **Reduce requirements for registration and testing of products under the Biocidal Products Directive.** A particular complaint was that there is currently a need to re-register a chemical and supply new test results every time it is used in a new preparation. This achieves little in terms of SHE protection but greatly inhibits the manufacture of biocidal paints in the UK. One interviewee recommended the registration requirements be reduced or removed for firms producing small amounts of each product. He noted that that the registration requirements under the BPD appeared to be designed for large multinationals with large product volumes. By contrast, small firms could have small runs of a large number of branded products. However, the UK could not make such changes unilaterally.

13) **Remove the requirement on firms to research the geology beneath their sites under IPPC. Instead, require experts in the EA to instruct firms on the geology of ground underneath sites, based on information available to them, and any concerns this causes**. The current requirement is very expensive for chemicals firms, since its personnel are not expert geologists. Where there are several IPPC sites within the same area, this can mean repetition of research by consultants (and multiple fees for the same work). For the EA to do anything with the geological information supplied would imply that they do have expertise in geology. In this case, it would make more sense for them to do the analysis from the start, rather than the firm which itself is expert in other issues.

14) **Amend the European Commission's Green Procurement Plan.** This had forced local authorities to buy environmentally friendly products, but had given no information on how they should do this. Interviewees stated that, in response, some local authorities had taken idiosyncratic and ill-informed decisions, which had caused chaos, including many ill-informed requests of chemicals companies. Currently the industry is working to provide councils with proper guidance on how to implement the GPP. However, some respondents questioned the

necessity of the GPP, given that the chemicals industry is already subject to many environmental regulations.

15) **Under the Hazardous Waste Regulations and CHIP, de-classify items as 'hazardous' if these pose a trivial risk to public health or the environment**. For example, at present bags in which raw materials are delivered are classified as hazardous waste, unless they are cleaned to a degree that is impractical to achieve. Similarly, interviewees considered that the classification of empty paint tins and Intermediate Bulk Containers (IBCs) as hazardous waste imposed excessive costs for a minimal environmental gain. This change could only be achieved at the EU level, however.

16) **Under landfill regulations, permit landfill disposal or incineration of empty sacks that have contained toxic materials**. At present the landfill regulations prohibit either disposal method, so that the bags have to be washed instead, which – according to the interviewees - has a worse environmental impact.

6 Proposals for changes to the process of producing regulations

Some interviewees argued that changes to the political process were required to prevent what they saw as an 'avalanche of regulation' that caused ongoing problems for their firms.

The interviewees' proposals focussed on reducing the volume of new regulations, and adopting a more risk-based approach to writing regulations. They included:

1. **Legislators to think carefully what new regulations would add to existing ones**. In several cases, it was argued that the adoption of new regulations created large costs by requiring a different type of paperwork, but the increase in safety due to the new regulation was negligible or zero. For example, COMAH appeared a marginal improvement over the pre-existing CIMAH and Planning Hazardous Substances Regulations (Scotland), and DSEAR. This proposal would need to apply at EU as well as UK level.
2. **Legislators to consider the impacts of regulations along the supply chain**. Past changes to hazardous waste disposal and hazardous goods carriage legislation have significantly reduced the number of suppliers in the market, enabling them to increase costs significantly. Adequate time periods for compliance could help the market to adapt, thus avoiding these outcomes.
3. **Legislators to avoid changes that would require reclassification of chemicals unless well justified by safety gains**. Interviewees mentioned, for example, that the move from CHIP 2 to CHIP 3 had caused a large cost of reclassifying chemicals that could now not be recovered, but for little apparent gain. This would need to be implemented at EU level.
4. **Where changes in classification are required, ensure these are 'stacked up' and thus only required every two years or so.** This ensures that the required changes were predictable and that users could be briefed about them in one mover. The process of changing transport regulations already used this procedure. All related regulations, (such as CHIP, the detergents, cosmetics and transport regulations) should work to the same timeframe so that the changes could be presented to downstream users coherently without them having to understand which law changed what. Downstream users could also then update all their safety data sheets in one go.
5. **UK legislators to consider more closely whether UK implementation of EU regulations is stricter than in the rest of the EU** and to consider the cost-benefit consequences of this situation for the UK. For example, it was noted that the UK's rules on sulphur dioxide

emissions were tighter than those applying elsewhere in the EU under the EU Air Quality Regulations. Interviewees also cited the implementing regulations for the Carriage of Dangerous Goods, which ran to 94 pages in the UK but only 19 in Ireland. This is consistent with the aims of the Davidson Review of the Implementation of EU legislation.

6. **Examine the value of assumptions used in cost-benefit assessments of regulations.** There was concern that proper cost-benefit assessments of regulations had not been carried out, resulting in regulations that could only be justified if an extremely high "value of a statistical life" was assumed. One example of concern was the Working at Height Regulations, which an interviewee argued assumed that very large expenditures were justified to reduce risks to life marginally.

7 References

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Annex 1 Questionnaire for firm representatives

The following questionnaire was used as the basis for the interviews in the main part of the study. It incorporates suggestions from both interviewees and the Steering Group on the questionnaire used in the pilot study. The differences between the two questionnaires are minor, so we combine the results from both the 10 pilot-stage and 38 main-stage interviews in this report.

Evaluating the Cumulative Impact of Safety, Health and Environmental Regulation on the UK Industrial Coatings, Aerosols and Speciality Chemicals Sectors

Study by LE/RPA for Chemicals Regulatory Forum

Questionnaire for Firm Representatives

Introduction

Under the 'Better Regulation Agenda' the UK government intends to reduce the burden of regulation on business, while maintaining the same outcomes in terms of protection of workers, consumers and the environment.

As part of the 'Better Regulation Agenda', the DTI has commissioned London Economics and Risk & Policy Analysts to study the effects of Safety, Health and Environmental regulation on the Industrial Coatings, Aerosols and Speciality Chemicals Sectors. The main source of information for this study will be interviews with representatives of companies.

We would like to ask you two main questions:

1) What is the total cost of safety, health, and environmental regulation to your business? and

2) How could the government change its enforcement or implementation of regulation, or the requirements of regulations themselves, to reduce the cost to business, while achieving the same policy objectives?

Some relevant regulations

The following is a list of some of the regulations that you may wish to discuss in your comments. However, please feel free to discuss regulations not on this list, or not to cover all those in this list.

Hazardous Waste Classification and Waste Disposal

COMAH

Packaging and Packaging Waste Regulations

Carriage of Dangerous Goods Regulations including DGSA

Dangerous substances in explosive atmospheres regulations (DSEAR)

CHIP/Dangerous Substances/Dangerous Preparations Directives

Biocidal Products Directive/Regulations

IPPC/Pollution Prevention and Control Regulations

Solvent Emissions Regulations

COSHH Regulations

Management of Health and Safety at Work Regulations

Cosmetics Regulations

Food Contact Regulations

General Product Safety Directive

The Reporting of Injuries and Dangerous Occurrences – RIDDOR

Health and Safety (First-Aid) Regulations

Interviewees

Please could we clarify who you are and your job titles?

Table Q.1: Interviewees		
Interviewee No.	**Name**	**Job Title/Description**
1		
2		
3		

About your Firm

Some interviewees are happiest describing firm activities and regulatory costs at the level of the plant, others at the level of the firm's entire UK operation, and others at the EU or global level. The Table below first asks the level at which you would like to answer this questionnaire, and then asks for details on this level of your firm.

Table Q.2: Company details	
Company Name	
Firm level described	
SIC Code	
SIC Subclass	
Activities	
Turnover	
Employees	
Total payroll	

The Cost of Regulation

1) What is the total annual cost of compliance with current safety, health and environmental regulations to your firm?

It may be helpful to think of this cost as a percentage of turnover. In these terms, is it

Below 0.05%	
Between 0.05% and 0.1%	
Between 0.1% and 0.5%	
Between 0.5% and 1%	
Over 1% (please specify)	

2) What is your firm's total annual cost of compliance with current safety, health and environmental regulations in terms of

Table Q.3: Costs of regulation		
Cat. No.	**Category**	**Annual Cost**
1	Staff salaries	
2	Other time commitments	
3	Equipment	
4	Other plant or process costs	
5	External advice and testing	
6	Charges imposed by regulator	
7	Fees for permits and inspections	
8	Foregone business	
9	Changes to products	
10	Changes to labelling	
11	Other costs (please describe)	

3) Has the introduction of new regulations also created one-off costs for your firm that are not included in the annual costs you have quoted above?

4) Where there were one-off costs of new equipment, how many years do you expect this equipment to last?

5) Does your firm also incur significant costs in thinking about proposals for future regulations that are not yet law?

6) The government believes it is necessary to regulate the chemicals industry for several reasons including to protect public health and the environment. So it would probably not be sensible to get rid of all regulation imposed on a business like yours.

However, some costs that regulation imposes could be excessive. For example, the way regulations are enforced may not be proportionate to the risk posed to the environment and to the public. Also, some regulations may be over-prescriptive rather than leaving firms to decide how best to achieve the outcome the regulation requires.

So, going back to the costs you mentioned above, how much of these would you say is due to unnecessary or bad regulation?

Table Q.4: Unnecessary costs of regulation		
Cat. No.	**Category**	**Annual Unnecessary Cost**
1	Staff salaries	
2	Other time commitments	
3	Equipment	
4	Other plant or process costs	
5	External advice and testing	
6	Charges imposed by regulator	
7	Fees for permits and inspections	
8	Foregone business	
9	Changes to products	
10	Changes to labelling	
11	Other category (please describe)	

Thank you for these numbers.

7) Now, going through the categories above, or alternatively taking a few regulations in turn, please could you tell us how the unnecessary costs are being imposed and what you think is the largest cause of such costs. For example are the regulations over prescriptive or are they not providing clear guidance?

Proposals for Reduction of Regulatory Cost

We would now like your suggestions on how the government could reduce the cost of compliance with current regulations, while maintaining the same regulatory outcomes.

8) Which regulations in the area of health, safety and environmental protection do you feel present the most scope for improvements in the way they are implemented or enforced?

Table Q.5: Regulations where improvement possible	
Regulation	**General Area**

9) How could the burden of these regulations on your firm be reduced?

Table Q.6: Suggestions for improvements in implementation or enforcement of existing regulation		
No.	**Relevant Regulation(s)**	**Nature of Suggestion**
1		
2		
3		
4		
5		
6		

10) We will now list some suggestions for changes to the way regulation is implemented or enforced. You may have mentioned some already. Do you believe these suggestions could achieve significant improvements?

Table Q.7: Areas of potential improvement to implementation or enforcement of existing regulation

No.	Suggestion	Interviewee Response
1	More information on regulations	
2	Different method of information dissemination	
3	Reduce duplication of regulations/forms	
4	Better written forms	
5	Reduce duplication of inspections	
6	Reduce cost per inspections	
7	Reduce frequency of inspections	
8	Make inspections more risk-based	
9	Change penalties for non-compliance, make more risk-based	
10	Reduce duplication of policy across regulators	

11) Are there changes to laws on health, safety and environmental regulation that the government should consider, perhaps because these regulations have high unnecessary costs?

12) Are there regulations in areas other than health, safety and environmental protection that create high unnecessary costs on your business?

Benefits of Regulation

13) Do you think safety, health and environmental regulations have benefited your firm, and in what way?

14) If the answer to 13) is yes, can you quantify the benefit?

15) This report may lead the government to change the implementation or enforcement of some existing regulations. Are there any feasible changes of this type that would cause problems for your firm?

16) The government intends to conduct other studies of this type in future. Do you feel the structure of this questionnaire could be improved in any way?

We thank you for your time and co-operation.

Annex 2 Study toolkit

This annex describes how other researchers could replicate our methods in future studies of other sectors of the economy. Our methods were designed to achieve two goals: to measure the total and excess or unnecessary cost of compliance with regulation, and to solicit recommendations for reductions in the cost of compliance with SHE regulation.

Further description of our method is necessary here, however, because several important points are not explained fully in the main report. This section discusses the following points:

- Pilot/main study format,
- Questionnaire design,
- Encouragement for survey participation,
- Sample selection,
- Defining the sector of interest,
- Determination of firms' sector,
- Measurement of cost of regulation,
- Measurement of the excess cost of regulation,
- Amortization of one-off costs into equivalent annual flows,
- Weighting interview results by firm size,
- Sample design,
- Interview checking,
- Proposal checking, and
- Proposal costing.

Pilot and main study format

The study was conducted in two stages. These were a pilot study of 10 interviews followed by a main study of 38 interviews. Interviewees during the pilot stage were invited to make suggestions on how the pilot questionnaire could be improved. The main changes made to the questionnaire on the basis of the experience of the pilot were:

- Clarification of questions and simplification of the questionnaire from the interviewee's perspective. For example, there was no need to mention complicated concepts before interviewees were specifically asked to discuss them.
- A question about the expected lifetimes of new equipment was added to capture the annual equivalent of one-off costs of compliance with regulations. The interviewers could then construct an annual equivalent cost of any one-off costs using the amortization methods we describe below.

- A question on time spent thinking about future regulations was added. While the study focused on the cost of compliance with current SHE regulation, after reflecting on firms' responses to the pilot interviews, the Steering Group felt it was important to be aware of the ongoing costs caused by new regulatory proposals.

Questionnaire design

The main concept which the questionnaire aimed at was "The reduction in cost possible to the firm if existing SHE regulations were both rewritten and implemented in the least-costly method possible while maintaining current levels of protection".

We defined these potential cost savings to include both potential savings from better implementation and potential savings from better regulation to try to capture the fullest sense in which regulation imposes unnecessary costs on business.

This central concept is useful but complicated, since it depends on the compliance costs of a hypothetical package of regulations and implementation methods. Therefore, we began the questionnaire by asking about the total costs of compliance with regulation. This proved to be a useful introduction to the question of which costs were unnecessary or excessive.

Were we to conduct the study again, we would make some changes to the questionnaires, in the interests of clarity and brevity, as we now describe.

In the interests of clarity, we would add a row to the bottom of each of Tables Q3 and Q4. This row would be entitled 'Total Cost'. The interviewers would tend not to have time to fill this in during the interview, but would have to do so when writing up the interview. A requirement to sum up the costs mentioned would force interviewers to clarify the sense of the numbers they had noted elsewhere and provide a means of ensuring that the estimates we receive from firms were consistent.

In the interests of brevity, we would delete Question 8 and Table Q5. In practice the material received in response to this question was very similar to that received in response to Question 9, and hence entered in Table Q6.

Encouragement for survey participation

Conducting interviews with firm representatives represented a considerable challenge. The representatives with whom we spoke were typically cooperative, but were often very busy, and we did not pay them for their time. While some interviews were conducted by telephone, most were conducted through in-person visits, which created further logistical problems of trying to schedule several interviews in the same area on the same day or on consecutive days.

We received assistance in contacting firms from three chemical industry trade associations, Scottish Enterprise and the DETI in Northern Ireland. From these bodies combined, we received about 90 names of firms. We contacted all of these firms and interviewed 48. About 20 firms did not respond to our contacts, around 10 declined to participate, and we ultimately chose not to interview (or not to pursue initial contacts further with) around another 10

firms that may have been willing to participate. Two companies that had indicated their willingness to be interviewed later withdrew their offers, at too late a stage in the project to find replacements.

Sample selection

In terms of firm size, we made particular efforts to interview firms of a wide range of sizes. These consisted largely of pursuing the smaller firms suggested to us by trade associations for interviews. We were successful in interviewing firms of a variety of sizes (see Figure 1). However, we had little capacity to reach firms that were not members of trade associations. Such firms could have ended up on our list of candidates only through Scottish Enterprise and the DETI in Northern Ireland. In fact, only one of the firms we interviewed was not a member of any trade association.

Given the challenges of persuading firms to participate in the survey, we chose not to be overly restrictive about the activities of the firms we interviewed, as described by their SIC codes (see Figure 3). We felt it would not have been possible to conduct even 48 of the envisaged 50 interviews had we been very restrictive about our sample. It must be remembered that even if the ideal sample of firms can be identified, many of this sample may simply decline to participate in a survey.

Defining the sector of interest

In this study, data availability limited the precision of the definition of the sector. The fact that the study was defined at a very high level of aggregation (namely the 4 digit SIC code) sub-sectors that lay outside the scope of the study - as set out in the ToRs - were included in the analysis which may have served to overestimate the total and excess cost of regulation.

In the future, we believe it is important that data at a more disaggregated level is obtained that will allow a more precise definition of the sector to be used which will improve the accuracy of the estimates. We also recommend that such data is broken down by firm size band as this will better capture differences in the cost of regulation across firm size bands when the responses of firms in the sample are extrapolated to the sector overall, improving again the accuracy of the estimates.

Determination of firms' sector

The study requires describing the sector in which each firm operates. The only viable means of doing so appears to be through firms' SIC codes. While interviewees gave their own descriptions of their firm's activities, these did not follow a systematic set of categories and thus could not be used to summarise the interview results or link the interview results to national data.

We used the FAME database and Companies House records to assign an SIC code to each firm in the sample. For the majority of firms, both databases identified firms within the same sub-sector. In the cases where both sources led to different SIC codes the code within the ToRs was used. In a few remaining cases, the SIC code revealed a sub-sector outside the ToRs.

For five firms Companies House listed up to two SIC codes inside the ToRs per firm. In these cases, companies were contacted by phone to corroborate their sub-sector. If firms operated in more than one sector a share of total turnover was allocated to the sub-sector with larger turnover.

If future studies adopt the approach used in this report of extrapolating from interview results to the national level using data from the Office for National Statistics' (ONS) Annual Business Inquiry (ABI), it would be useful to establish which SIC code the ONS had ascribed to each interviewed company.[19] The consultants should use the same SIC codes as the ONS to maximise the accuracy of the extrapolation process. Such an exercise should preferably be carried out using data at a more much disaggregated level than has been done here.

Measurement of total cost of compliance with regulation

Several firms put considerable effort into establishing the cost of regulatory compliance before we arrived for the interviews. Some had, for example, created spreadsheets adding up these costs, although they were not always willing to supply these to the consultants.

We encouraged interviewees to think of the cost of compliance with regulation as the cost of activities they would not undertake were regulation not to exist. Thus, where interviewees noted that the cost of observing a particular health and safety practice was high, we challenged them to state whether they would observe this practice even if not required to do so by regulation.

Phrasing the question on the cost of compliance in this way tended to reduce the quoted value for the cost of regulation interviewees cited, because many claimed their firm would carry out most of the tasks prescribed by regulation even were it not obliged to. Several interviewees noted that insurance companies would in practice require firms to adopt various health and safety measures.

Measurement of the excess cost of regulation

Firms were able to provide much less evidence on the excess cost of compliance with regulation. Our question about excess cost referred to the hypothetical situation in which regulations were written and implemented in the manner imposing the least compliance cost on firms while achieving current levels of SHE protection. This is a complex, hypothetical question to answer. Typically, interviewees stated that in general they thought a lot of regulation was unnecessary, but found it difficult to place a figure on the excess costs their firms experienced.

Our response to this difficulty was to push interviewees to enumerate as many excess costs as they could, in part by telling them that their complaints about regulations would be more credible if numbers and examples were attached. However, we did not insist on a high level of accuracy or detail in

[19] We asked the ONS how in general firms were allocated to SIC codes for the ABI, and were directed to a website saying this was done 'by main business activity', which we did not find a definitive answer.

interviewees' answers, as we typically felt this would reduce interviewees' willingness to engage with the rest of the questionnaire. Thus, ultimately, we encouraged the interviewees to give us a 'back-of-the-envelope' figure for the excess cost.

Amortization of one-off costs into annual equivalent flows

The costs of SHE regulations on the UK chemicals industry can include administrative costs and/or capital costs and investment needed to meet compliance. In several cases, interviews listed costs of compliance with regulation that were one-off in nature. For example, some noted that the reclassification of chemicals introduced by recent changes to CHIP had required the firm to purchase costly new software, which the firm did not expect to replace. In other cases, new regulations had required firms to buy new equipment with an expected life of 5-10 years, which the firm would have to replace at the end of this lifetime.

It is, in principle, straightforward to translate one-off costs of compliance with regulation into annual equivalent flows. One can do so by asking "If the firm were to borrow the funds necessary to make the one-off payments, what constant annual payment of interest (and possibly principle) would keep the firm's debt from exploding thereafter?" Note that phrasing the question in this manner implies that a firm could finance a cost of X pounds by borrowing X and then paying interest of rX every year forever, where r is the interest rate.

The amortization formula we use is thus

$$AC = rP \times \left(1 - (1+r)^{-N}\right) / \left((1+r)\right)$$

where

AC is the annual equivalent cost,

P is the initial one-off cost,

r is the interest rate, and

N is the expected lifetime of the item purchased at cost P.

We use an interest rate r designed to capture firms' cost of capital. This is because we assume that, were firms to borrow to finance one-off compliance costs, they would do so at their cost of capital. We use a cost of capital of 5.4% in real terms, because the real rate of return on UK equities has averaged 5.4% over the long run.[20]

A conceptual problem with including past one-off costs due of compliance is how far back in time to include such costs. We judged that a large cost incurred in the last two years was relevant, and included this in the cost of regulatory compliance we calculated. Were we to include all past one-off

[20] Average annualised real rate of return on UK equities from 1900 to 2004, ABN AMRO/LBS (2005).

costs of compliance, the implied annual equivalent cost could be very large. This might give a misleading sense of the total social impact of compliance, since the introduction of regulations may also have had a series of counterbalancing positive effects that are very difficult to measure.

Weighting interview results by firm size,

Our interview results on the total and excess cost of regulation mostly come from small firms. As Table 3 in the main report shows, 20 of the 39 estimates we received on the total cost of regulation and 16 of the 29 we received on the excess of regulation were from firms (or plants) with turnovers of less than £20m per year.

However, data supplied by the ONS show that larger firms are responsible for the majority of the sector's turnover. This means that without some compensatory weighting scheme for firm size extrapolating our interview results to the sector overall would overemphasize the responses of small firms.

We constructed a weighting scheme for firm size using data supplied on a bespoke basis by the ONS. Separate sets of weights were derived for the total and excess cost of regulation as the number of estimates we received was different (39 and 29 respectively). These are shown in Table 5 in the main report.

The manner in which the two sets of weights were calculated is set out in Table 9 overleaf. Row 1 shows total UK turnover in the industrial coatings, aerosols and speciality chemicals sector – as defined in this study – broken down by turnover category in 2004.[21] Row 2 shows the way in which total sector turnover is distributed across the different turnover groups in percentage terms.

Row 3 sets out the number of responses which we received in each turnover group in the sample while Row 4 shows how these responses were distributed across the different turnover groups in percentage terms. The two sets of weights used to adjust the estimates of total and excess cost of regulation are then simply the ratio of the ABI population over sampled percentages. Dividing – for each turnover group – the figures in Row 2 by Row 4 we obtain the two sets of weights shown in Row 5.

In our extrapolation of interview results to the entire sector, the responses of each firm are adjusted by multiplying the firm's estimate of total and excess cost of regulation by the respective weights corresponding to their particular turnover group. Thus, for example, for a firm with a turnover between £10m and £20m, we multiply its estimate of the total cost of regulation (as a share of turnover) by 0.33 and its estimate of the excess cost of regulation (as a share of turnover) by 0.27. A simple average of the total and excess cost of regulation is calculated and this is multiplied by the total turnover figure for the sector to reach an estimate of the total and excess cost of current SHE regulations in value terms.

[21] Source: ONS, Annual Business Inquiry.

This methodology probably leads to a slight underestimate of the total and excess cost of compliance with regulation within the sector. This is because some of our interviewees quoted turnovers at the plant rather than firm level. This means we may underestimate the size of firms in our sample and, since the smaller firms or plants reported higher excess costs of compliance, understate the sector-wide excess cost. This downward bias is likely to be fairly small, however, since most of our respondents quoted a turnover that represented most of their firm's entire UK turnover.

Table 9: Construction of weights for firm size

Row	SIC Code	Total UK turnover (£m) by firm turnover, £m per annum				
		Firm turnover, £m per annum				
		Up to 10	**10 to 20**	**20 to 40**	**40 plus**	**Total**
1	Total	1,929	1,542	1,908	17,775	**23,154**
2	Percentage	8.3	6.7	8.2	76.8	**100**
3	Frequencies	12 (9)	8 (7)	11 (6)	8 (7)	**39** **(29)**
4	Percentages	30.8 (31)	20.5 (24.1)	8.2 (8.2)	76.8 (76.8)	**100** **(100)**
		Derived sample weights				
5	Weights	0.27 (0.27)	0.33 (0.28)	0.29 (0.4)	3.74 (3.18)	

Source: turnover by firm size and SIC code from ONS Annual Business Inquiry, bespoke analysis.

Note: Responses and weights corresponding to the excess cost of regulation are in parentheses.

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Sample design

In a future study (for this or other sectors in the economy) it could be interesting to use a larger number of firms. If this were the case we would recommend using a stratified sample.

Stratification is the process of grouping members of the population into relatively homogeneous subgroups before sampling. We would recommend grouping the population by SIC code and by firm size (measured, for example, as turnover or number of employees). Then apply random sampling within each group (or stratum).

With this technique some categories would be over-sampled.[22] To re-establish the correct proportions the data need to be weighted. The weights need to be computed using the ratio of the population (or hypothetical

[22] This process often improves the representativeness of the sample by reducing sampling error. It can produce a weighted mean that has less variability than the arithmetic mean of a simple random sample of the population.

balanced sample) and the sample (or actual responses) for each one of the strata.

We would recommend the following steps.

Step 1. Choose the sample size (this will depend on the allocated budget for the project). For example, for 7 sub-sectors and 4 size categories a good number could be 140 or 280 which will allow for 5 or 10 responses in each of the 7 by4 cells.

Step 2. Choose the groups for stratification of the sample (we would recommend to stratify by 7 sub-sectors and 4 different sizes, as measured by turnover).

Step 3. Sample randomly a number of firms in each of the 7 by4 groups, and obtain a variable of interest (total or excess cost) for each sub-sector *j* and size *i.*

Step 4. Estimate statistics by using appropriate weights constructed as using population and sample frequencies for each sub-sector *j* and size *i.*

Interview checking

After conducting the interviews, we wrote them up in slightly abbreviated form and sent them to interviewees for their review. Not all interviewees responded to this request within the time scale of the project. We told interviewees that the write-ups would eventually go to the DTI, though with firm names removed, and also gave them the opportunity to indicate any data other than the company name that they felt could identify their particular company.

A minority of interviewees chose to amend the text of the interviews. Some did so in the interests of correcting misinterpretations by the interviewer, some because they wanted to add further thoughts that had occurred to them since the interview, and others because they wanted the text of the interview write-ups to disguise the identity of their firm further. For example, some contended that references to specific examples of problems with regulation would allow their firm to be identified even without the firm name being given.

Proposal checking

After conducting the majority of the desired interviews we checked the sense and feasibility of the proposals we had received for changes to regulations or implementation in two ways:

- By meeting with representatives of the DTI, the British Coatings Federation and the British Association for Chemical Specialities to review the entire proposal list, and
- By circulating the list of proposals particularly relevant to Scotland to all our Scottish interviewees and to the Scottish representative of one of the trade associations, and inviting their responses. Other trade associations told us they did not have a specific representative in Scotland.

From this meeting and the responses we received from Scottish contacts, we received comments to the following effect:

- Which proposals required law changes and which did not
- Which proposals were largely duplicates of others and could be combined
- Which proposals the trade associations thought had already been implemented, although awareness of these solutions might be limited, and
- Which proposals the trade associations found particularly well judged.

We also received some feedback on the feasibility of the proposal that regulators write short and clear guidance notes on the requirements and relevance of regulations. Some representatives of trade associations argued that the core problem was long and confusing legislation, and that therefore writing short and clear guidance notes was difficult.

Proposal costing

At a fairly late stage in our report, some interest was expressed in producing numerical estimates of the amount of compliance cost that could be saved by implementing particular suggestions interviewees had made. Such an output was not required by our terms of reference, however, and accordingly our questionnaire was not designed to elicit this information. Thus, we are not in a position to estimate the savings that could be achieved from implementing particular proposals.

To generate estimates of the compliance cost that could be saved by implementing particular suggestions, we would have needed to break our study into two parts. The first part would have had to solicit the reform proposals, and then settle on a small number to take forward having first checked their feasibility. The second part would have had to go to different firms and ask them how much they would expect to gain or lose by implementing each proposal. Firms might have an incentive to exaggerate their expected gains and losses in such a second stage, however.