Professional Education and Training for Sustainable Development in the UK and the Netherlands

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EUROPEAN FOUNDATION
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1. Executive summary

1.1 Background

The majority of Small and Medium-sized Enterprises (SMEs), which play such an important part in the EU economy, are still not benefiting to any great extent from environmental education and training or the support in place to help them. As a result most SMEs, and in particular the small and micro enterprises, are failing to take advantage of the benefits associated with many aspects of environmental improvement, in particular those associated with waste minimisation and the adoption of cleaner technologies. As a result they are failing to improve their competitiveness and failing to contribute to a more sustainable future.

This new work, which concerns the UK and the Netherlands, specifically explores the difficulties faced by SMEs, focusing on environmental education and training, both academic and vocational, in the following three industrial sectors:

- Printing;
- Food and Drink;
- Speciality Chemicals.

The work therefore complements previous studies, highlighting recent changes and offering a more detailed examination of the 'SME problem'.

1.2 Objectives

The study has three main objectives:

- to identify the professional education and training provision required in relation to SMEs as part of the move towards sustainable development;
- to highlight the job profiles required in SMEs and by organisations assessing the performance of SMEs [e.g. the regulator];
- to point to the role of actors involved in the process of change.

1.3 Method

The method of approach has been a conventional one involving a literature review, a large number of consultations and synthesis of the findings into this report. To provide a clear and detailed picture of SME needs and their views of current education and training provisions, case study SMEs were interviewed, 6 in the UK and 4 in the Netherlands. These companies:

- covered all three chosen sectors;
- covered all sizes of SME, micro, small and medium;
- were reasonably typical and hence representative of the sector;
- had significant environmental impacts (either pollution load or resource consumption);

Additional consultees included:

- national training organisations and bodies;
- universities and colleges;
- relevant trade associations and professional bodies;
- other education and training providers;
- support organisations;
- large companies;
- the main regulator/s.

A regional approach was taken in each country to gain a more detailed understanding of the issues, the main focus being the Midlands region of England and the Overijsell region of the Netherlands. Naturally some national organisations were also consulted.

1.4 Main Findings

General Needs and Main Drivers
SMEs make a significant contribution both to the UK and Dutch economies and to environmental damage and resource consumption. Many smaller SMEs are unregulated (falling below thresholds) or fail to participate in voluntary agreements (Netherlands). Those SMEs that are regulated, while meeting minimum emission limits, still tend to be wasteful of resources, despite the fact that they often operate with very tight profit margins. There remains, therefore, a strong need to reduce wastage and pollution, for the sake of the environment, to strengthen competitiveness and to secure and increase employment.

Regulation remains the key driver of end-of-pipe pollution control, while cost reduction, risk reduction, regulation and increasingly supply chain pressures are driving the uptake of EMS (ISO 14001) and waste minimisation activities. While new regulation triggers a wave of both supply of and demand for conferences, workshops etc. (particularly in the UK) it is the move to ISO 14001 and increasing interest in waste minimisation that are the longer-term drivers of the demand for environmental education and training. Other drivers, such as employee concerns, concern for the local community etc. are very much secondary.

Responsibilities, Skills and Competency Needs
Environmental duties and responsibilities can cut across many roles, from purchasing, marketing and finance to production management, plant maintenance and equipment operation. Many SMEs however do not recognise this and mostly see environmental responsibilities as being purely related to regulatory compliance, pollution control and waste disposal issues. Responsibility is also seen as mainly resting at the managerial level rather than with shopfloor staff, although seemingly less so in the Netherlands than in the UK.

In the main, key environmental responsibilities rest with health and safety, quality management and other production/technical staff in medium-sized SMEs and with a technical director or MD in the smaller SMEs. Multi-tasking is the common approach with environmental roles and responsibilities being added to existing 'core' business responsibilities. The latter are largely seen as being the most important, with environmental responsibilities being secondary. Some medium sized SMEs, however, do however take a more integrated approach and in some cases employ specialist environmental or HS&E managers.

UK SMEs see the key skills and competencies as being those associated with regulation, EMS and waste minimisation rather than those associated with, for example, design or purchasing. The Dutch SMEs, while still concerned with regulation and liability issues, tend to take more interest in EMS, energy efficiency, waste minimisation and even design for the environment, green purchasing, environmental investment appraisal etc.

In the main, environmental skills and competencies tend to be 'grafted-on' , staff being recruited as they always were for their core skills and then trained in the additional environmental areas. While most SMEs do not see qualifications as being important per se, some medium-sized SMEs are employing environmental managers with environmental degrees and/or relevant experience.

SME Activities and Preferences

Environmental training and education is mostly conducted in a reactive and ad hoc way in SMEs, with very few using any form of training needs assessment or making specific provisions in terms of budgets or staff development plans. The training itself is still dominated by self-help, on-the-job and informal internal training, topped-up by external seminars and short courses. In the main companies are accessing training relating to:

- environmental regulation;
- environmental management;
- waste minimisation.

The consensus is that training provisions need to be low cost, very concise, modular/flexible, sector specific and easily accessible. Key providers include:

- trade and industry organisations;
- publicly-funded bodies;
- government departments and agencies;
- not-for-profit organisations;
- universities and other higher education establishments.

The Regulators

In the UK the Environment Agency employs hundreds of staff covering most environmental disciplines including pollution prevention and control, waste minimisation, flood defence, fisheries, conservation etc. Responsibilities are well defined. The Agency is aspiring to a situation whereby training is needs driven, competency requirements being set out in accordance with roles and responsibilities and the corporate plan. Much of the training is done in-house through the National Training Service although some external organisations are used.

In the Netherlands the regulatory responsibilities are divided between the provincial and local authorities and the National Inspectorate. Most staff are qualified to degree level as in the UK. In terms of ongoing training there is no national training organisation or plan, and hence training is done on an ad-hoc basis, often through material provided through the environment ministry (VROM) and occasionally through the use of consultants. There are, however, various higher education and vocational courses designed for inspectors

Education and Training Provisions

There is no shortage of environmental courses, seminars, workshops etc. in either the UK or the Netherlands, these being provided by higher education establishments and various trade/industry, publicly-funded, not-for-profit and commercial organisations. In many cases the training is done through partnerships involving business support organisations and other local and national organisations.

In terms of vocational qualifications, in the Netherlands there is quite a wide range of part-time environmental MBO and HBO courses (mostly relating to environmental technology and co-ordination), while in the UK NVQs and SVQs are starting to play a part with a handful that are 'environmental' (including a standard for Environmental Management) and many more that are related to correct process operation and hence to waste minimisation. Sector-specific and occupation-specific national organisations (the NTOs in the UK) are helping to develop the appropriate standards and qualifications.

Private sector provisions, in particular commercially run conferences and consultancy services, are generally seen as being costly and often inappropriate. While there are still inappropriate provisions being promoted, increasingly providers are meeting the specific demands and needs of industrial SMEs, much of the more recent material being sector-specific and more carefully focused. More and more low-cost distance learning courses, workshops and flexible in-company packages are being provided, from publicly-funded organisations and programmes (e.g. the Senter/BMDs in the Netherlands, the Environmental Technology Best Practice Programme in the UK), trade and professional bodies, not-for-profit organisations (e.g. Groundwork in the UK), universities/colleges and, in the Netherlands, trade unions. Large companies are also starting to take a role through offering assistance with EMS (e.g. Rover in the UK).

While almost every conceivable type of provision is represented the overall picture can be very confusing for SMEs. Many SMEs get bombarded with literature from the public and private sectors and often get confused over what is worth accessing. Increasingly training providers are gaining accreditation from professional bodies (such as the IEM in the UK) to help give SMEs confidence in the quality of the services and products they are offering.

Other Support Mechanisms

In terms of support, there are mechanisms in place in the UK and the Netherlands to promote environmental improvement and its benefits and to provide guidance and to a lesser extent hands-on assistance.

In the UK there is great variation across the country and numerous regional initiatives in addition to those operating nationally (e.g. the Environmental Technology Best Practice Programme - ETBPP). Business Link, which aims to be the one-stop-shop for SMEs, is little-used for environmental advice, many local Business Links offering no environmental services. In some cases not-for-profit organisations (such as Groundwork and BEA) are in competition with each other and consultants offering services, for example in terms of providing environmental reviews and assistance with EMS (ISO14001). Again the picture can be a confusing one for SMEs, 'initiative fatigue' turning them off environmental improvement.

Increasingly, however, the ETBPP, the Environment Agency, the Government Offices, local authorities, Chambers of Commerce, not-for-profit organisations and others are working

together to try and provide a more co-ordinated approach that better reaches small companies. Regional strategies, networks and co-ordinating bodies are being established in some areas to achieve this.

The situation appears somewhat simpler and more homogeneous in the Netherlands where the BMDs (Company Environmental Service organisations) and the Senter (Innovation Centres) provide regionally based support and training, co-ordinating their activities with local colleges, trade associations etc. They also provide most of the projects and services associated with the Cleaner Production Programme.

Barriers
While considerable efforts have been made to make courses and other material more suitable and accessible, and to promote training and its benefits, numerous barriers still persist, particularly in the UK. Demand for environmental education and training is still lowest from small and micro SMEs, in the UK and the Netherlands. Companies themselves perceive the main barriers as being:

- resources constraints, human and financial;
- accessibility, lack of local or on-site provisions;
- suitability, material often being too general or designed for larger companies.

These barriers are certainly real enough, particularly in the UK. There are however additional barriers:

- lack of awareness of the real benefits and cost-saving opportunities;
- poor awareness of skill/competency needs to capitalise on opportunities;
- poor awareness of provisions/support options to meet these needs.

There are also two key external factors which influence awareness of benefits, needs and provisions:

- the extent to which support networks are in place and properly co-ordinated;
- the extent to which support networks are active in reaching SMEs.

Most environmental support tends to be passive (informing rather than directly assisting), often due to budget constraints. As noted above, in the UK many SMEs are confused about the roles of the various players and the value of the provisions. This seems to be less of a problem in the Netherlands.

1.5 Concluding Remarks and Recommendations

Most of the findings here were also true in the early 90's as previous ECOTEC work shows, although the situation is improving. More and more SMEs are being reached by various initiatives and programmes and these SMEs are gradually improving their practices. The pace of change is slow, however, with many SMEs still unaware of the regulatory 'stick' and/or the waste minimisation 'carrot' as they apply to their business.

In the UK many smaller firms are confused by the wide range of support organisations, initiatives and provisions. In fact it appears that uncoordinated activity has often been counter-productive through its 'initiative fatigue' effect. In addition the passive help provided

has often not been enough to kick start improvement programmes. The way ahead, therefore, has to involve better co-ordinated, better directed and more active support and training provisions.

While far from all Dutch SMEs have positive attitudes to environmental improvement, the Dutch approach to environmental education, training and support, combining quite active sectorally and regionally-led initiatives, appears to be reasonably successful, reaching an increasing number of SMEs. The relatively high percentage (29%) of smaller SMEs (less than 100 staff) adopting environmental management systems is an encouraging sign that progress is being made. In the Netherlands, therefore, one would encourage more of the same, involving the BMDs, the Senter and the trade associations to take forward the Cleaner Production Programme 2 and other projects and programmes.

Not surprisingly, many of the recommendations that apply to the UK also apply to the Netherlands. In most cases it is a matter of degree, the Netherlands being in many respects just a few years further down the same road. Overall we would recommend that support and encouragement is given to :

- better co-ordinated and planned training for the Dutch regulators, perhaps making use of the UK Environment Agency model (NL only);

- continuing promotion of environmentally-related cost benefits, in particular to smaller SMEs, through provision of sector-specific case studies and detailed environmental review work;

- the greater use of environmental training needs assessment (TNA), in particular focused on competitiveness issues including waste minimisation and energy efficiency;

- the continuing development of environmental occupational standards and qualifications and the integration of environmental management ideas into other standards (e.g. those relating to manufacturing processes).

- the continuing integration of environmental, health and safety and quality management methods and systems. Waste minimisation and energy efficiency, for example, should be promoted as an integral part of good business practice and TQM;

- continuing development of SME-appropriate and sector-specific provisions that are quality assured by professional and trade bodies;

- the continuing provision of hands-on, practical and locally/regionally-based support;

- the greater use of low-cost direct support activities, for example through graduate placement schemes, subsidised consultancy etc.;

- greater encouragement for supply chain initiatives

- the simplification and improved co-ordination of support and training provisions at a regional level so as to reduce confusion and initiative fatigue (UK only).

While far from perfect, in many ways the Dutch model represents a good and reasonably successful one for other Member States to follow, offering a streamlined, direct and practical approach to SME environmental education, training and support. The UK is also improving its practices through better regional co-ordination (e.g. as is happening in the West Midlands and Wales) and greater efforts to reach SMEs (e.g. the Government's new Small Business Service, which aims in part to improve Business Link) and to promote lifelong learning in industry (e.g. through the UfI initiative).

Finally it is worth noting that certain regions, countries (including the Netherlands), and industrial sectors offer models that can be used to improve the overall effectiveness of environmental education, training and support throughout the EU. Such 'good practice' models should be investigated further to allow more rapid progress towards sustainable development.

2. Introduction

2.1 Background

This report, to the European Foundation for the Improvement of Living and Working Conditions, concludes the UK and Netherlands case studies concerned with Professional Education and Training for Sustainable Development.

There has already been much previous work carried out by the Foundation, CEDEFOP and others in the late 1980's and 1990's to gain a better understanding of the general education and training requirements and provisions in the field of environment. It has recently been understood however, that Small and Medium-sized Enterprises (SMEs), which play such an important part in the EU economy, are still not benefiting to any great extent from environmental education and training. As a result they are failing to improve their environmental performance, failing to improve their competitiveness and hence failing to contribute to a more sustainable future.

This new work, therefore, specifically explores the difficulties faced by SMEs, focusing on environmental education and training, both academic and vocational, in the following three industrial sectors in the English Midlands region (West and East) and the Overijsel Region of Holland:

- Printing;
- Food and Drink;
- Speciality Chemicals.

The work therefore complements previous studies, highlighting recent changes and offering a more detailed examination of the 'SME problem'.

2.2 Study Aims and Objectives

Essentially the study aims to identify current SME needs, current provisions aimed at meeting those needs and as a result the shortfalls and difficulties that remain. In this way the study can make recommendations as to the most promising ways forward. The study has three objectives as stated in the terms of reference:

- to identify the professional education and training provision required in relation to SMEs as part of the move towards sustainable development and to indicate the responses needed;
- to highlight the job profiles required in SMEs and by organisations assessing the performance of SMEs [e.g. the regulator];
- to point to the role of actors involved in the process of change.

2.3 Definitions

Environmental Education and Training
There are numerous definitions of education and training. A general an appropriate definition, set out by the UK Manpower Services Commission (MSC), is given below:

"A planned process to modify attitude, knowledge or skill behaviour through learning experience to achieve effective performance in an activity or range of activities. Its purpose in the work situation is to develop the abilities of the individual and to satisfy the current and future needs of the organisation".

The term 'environmental' can also mean many things. In the context of this study we are taking a broad definition of relevance to the operation of small manufacturing concerns :

"all physical media, including land, water and air, which can be polluted or damaged and finite resources which can be depleted or made unusable"

The study therefore relates to environmental education and training encompassing all aspects of pollution control, waste management, waste minimisation and to a lesser extent landscape and amenity.

SMEs
The definition of an SME most widely used (e.g. by the UK DTI) is a simple one, i.e.:

"an SME is a company employing less than 250 staff"

SMEs can be further classified as follows:

- Micro SMEs - 1- 9 employees;
- Small SMEs - 10-49 employees;
- Medium SMEs - 50-249 employees.

These simple employment-based definitions can be misleading in that they do not make use of turnover information or any other indicator of size. In heavily automated sectors, companies with very large turnovers can have small workforces, for example many of the UK breweries and distilleries.

2.4 Method of Approach

The method of approach has been a conventional one involving a literature review, covering a variety of documents as listed in the bibliography of Annex 4, a large number of consultations and synthesis of the findings into this report.

The majority of the consultees (Annex 1) were located in the chosen case study areas, although naturally some organisations (e.g. trade associations, training providers) outside these regions were consulted.

To provide a clear and detailed picture of SME needs and their views of current education and training provisions, case study SMEs were interviewed, 6 in the UK and 4 in the Netherlands. While this approach does not provide an adequate basis for statistical analysis, it does provide

the depth of investigation required to gain a practical understanding of the difficulties that SMEs face. The companies were selected on the basis that they:

- covered all three chosen sectors;
- covered all sizes of SME, micro, small and medium;
- were reasonably typical and hence representative of the sector;
- had significant environmental impacts (either pollution load or resource consumption);
- were prepared to spend at least two hours discussing the issues (staff time being a critical resource for most SMEs).

Trade associations and other contacts and directories were used to assist with the selection process. The interviews were conducted using a carefully designed questionnaire. The remaining consultees were selected on a pragmatic basis through knowledge, from previous work and contacts, of the relevant key players. New consultees were added as the study highlighted interesting new areas for investigation. The final list of consultees includes:

- relevant trade associations and professional bodies;
- universities and colleges;
- other education and training providers;
- support organisations;
- large companies;
- the main regulator/s.

2.5 Report Structure

The report continues with the UK Report, Part B and the Netherlands Report, Part C. Each of these is divided into sections. Section 1 covering SMEs in the National Context, Section 2 the National Education and Training Framework, Section 3 SME Environmental Education and Training Needs, Section 4 The Education and Training Needs of the Regulatory Agencies, Section 5 Provisions of Environmental Education and Training, Section 6 Conclusions and Section 7 Recommendations.

Annex 1 provides the list of UK consultees and Dutch consultees, Annex 2 the UK Company Case Studies, Annex 3 the Dutch Company Case Studies and Annex 4 the bibliography.

3. UK report

3.1 SMEs in their national context

3.1.1 The Economic and Social Importance of SMEs

Background
SMEs are vital to the health of the UK economy. It is estimated that there are around 152,125 manufacturing SMEs in the UK representing around 98% of manufacturing companies. 81% of enterprises have a turnover less than £1m, while micro SMEs account for 71% of all manufacturing enterprises. Interestingly, however, SMEs account for only around 45% (EU-15 average 56%) of all industrial employment, reflecting the dominance of large indigenous and multi-national companies in the UK. In this respect the UK is similar to Germany, France and Belgium. The UK manufacturing sectors with the highest incidence of SMEs include:

- Printing and Publishing
- Food and Drink
- Speciality Chemicals (including dyes, paints and inks)
- Plastics Processing
- Textiles and Leather
- Mechanical Engineering
- Surface Finishing (including paint spraying)
- Refractory and Ceramics

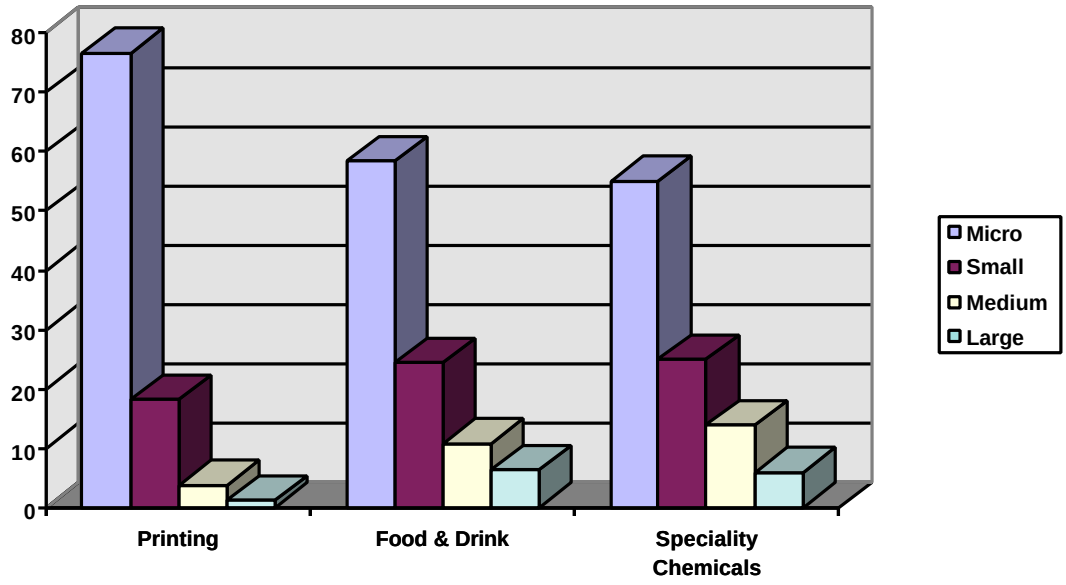
Table 3.1 below gives a breakdown of company size for a selection of sectors including those noted above, while Figure 3.1 shows the size distribution for the three study sectors.

Table 3.1: *Company Size Analysis in Selected Sectors*

Industry Sector	No. of Micro SMEs	No. of Small SMEs	No. of Medium SMEs	No. of Non-SMEs	Total Number of Companies
Printing and Publishing	13903	3330	686	229	18148
Food and Drink	6307	2633	1182	687	10809
Speciality Chemicals	688	313	176	75	1252
Plastic Processing	2512	1451	577	192	4732
Textiles	3204	1174	837	250	5465
Leather Tanning	93	56	29	7	185
Pharmaceutical	174	59	63	70	366
Refractory & Ceramic Goods	563	190	82	47	882
Photography Labs.	321	116	23	9	469
Foundries	274	359	169	43	845
Paper & Pulp	189	87	62	53	391

Sources: *CSO Business Monitor/Trade Associations*

Figure 3.1: *% SME Size Distribution in Chosen Sectors*



Sources: *CSO Business Monitor/Trade Associations*

It is worth noting that many larger companies and groups are made up of several sites/divisions. In some cases these sites/divisions act on a semi-autonomous basis with little guidance or support from their sister or parent company/ies. These sites can be thought of as pseudo-SMEs.

Type of Employment

In terms of type of employee, UK SMEs largely employ skilled and semi-skilled workers to operate machinery of one sort or another and additional clerical and managerial staff. Amongst small SMEs a typical example might be a small printshop with 3 presses that employs 24 staff including:

- *2 directors/managers plus the owner/MD;*
- *2 general clerical staff;*
- *1 commercial person looking after purchasing, contracts, invoicing etc.;*
- *2 shopfloor supervisors - 1 for each of 2 shifts;*
- *2 ink mixers/storemen - 1 for each shift;*
- *12 printing press operators - 6 for each shift;*
- *2 cleaners/unskilled staff.*

In this example, 2 of the 24 may have professional qualifications while 6 (25 %) may be highly skilled and 10 (42 %) semi-skilled. Similar breakdowns occur in other small SMEs including vehicle refinishers, engineering shops etc.

Obviously larger firms tend to employ more managerial staff who can afford to be more specialised than those in the small and micro SME where managers have to undertake all manner of tasks.

Location

In terms of location, the vast majority of SMEs are based in or close to urban areas and predominantly the old industrial areas. In England and Wales these include, in order of importance, the South East (London, Reading, Luton etc.). the West and East Midlands (around Birmingham, Coventry, Derby, Leicester etc.), the North (Lancashire, Yorkshire and the North East around Newcastle/Sunderland) and South East Wales (Cardiff, Newport, Swansea etc.). In Scotland the key areas are around Glasgow and Edinburgh (the central belt) and Aberdeen, while in Northern Ireland the key area is Belfast.

Even newer industries, including the electronics sector, have still chosen the older industrial areas where the availability of land, skilled labour and grants have been the main attractions. While some SMEs are located outside the traditional industrial areas, these tend to be the service sector companies (e.g. software, finance, consulting etc.) that do not rely to any great degree on the need to be close to raw material sources, major transport links/nodes or indeed the technically skilled and semi-skilled labour pools of the traditional areas.

Turnover and Profitability

SME turnovers vary enormously, both from sector to sector and within sectors. Data from the Office for National Statistics indicates that in the printing and publishing sector, for example, average turnover for small and micro SMEs is around £500,000. In the Food and Drink sector only 20% of companies have a turnover of more than £1m while only 8.5% of companies have a turnover greater than £5m.

In terms of profitability, most SMEs in the manufacturing sector achieve less than 5% profit margin, while those in the service sector can be achieving more than 10% profit. Certain sectors, for example textiles and footwear manufacture, have been in decline for decades, in the main due to the low cost of manufacturing overseas and the recent strength of the UK economy and hence the pound. Many UK SMEs have been forced out of the mass market into niche markets where quality and innovative design rather than cost are the key factors.

It is worth noting that the three chosen sectors are perhaps unusual in that they have not suffered to the same extent as say the textiles sector from foreign competition, having a strong home market reliant on short lead time delivery.

Relationships With Larger Companies

In terms of the relationship with larger companies, UK SMEs act both as subcontractors and, more commonly, as equipment and component suppliers. Many companies have to tender on a competitive basis for continuing work every year or so. The large companies are in an extremely powerful position in that they dominate the market and can be the sole customer of the SME. Good examples concern Marks and Spencer (retail) and Rover Group (automotive).

M&S dominate the UK retail clothes sector, with almost all UK garment manufacturers (mostly medium-sized pseudo SMEs (i.e. SMEs at a site level) supplying them. In several cases production is dedicated entirely to M&S. Rover, along with a handful of other UK vehicle manufacturers, dominates the small automotive suppliers, many of whom are traditionally found in the West Midlands.

Increasingly large companies in the automotive, retail, electronics, telecommunications, oil gas and chemicals sectors are applying pressure downwards to improve both the quality management and environmental management of their main suppliers, who in turn may pass

the same pressures down to their suppliers and so on. The reverse does not often happen since most small/micro SMEs have little influence with their larger customers in a market where the competition is always keen to take a contract and the customer to exploit the powerful position it holds. Those in the plastics sector are in a particularly difficult position, sandwiched as they are between the large polymer manufacturers (e.g. BASF, ICI) and their large customers (e.g. Unilever).

3.1.2 Affiliations - The Role Of Trade Associations, Unions Etc.

The trade unions' interest in environmental, as opposed to health and safety, issues has historically been limited in the UK. Surveys tend to show that general environmental issues are important to members, but the interest has not been reflected in activities further up the hierarchy. Environmental initiatives involving union members have occurred at a local level in individual plants and firms but there has been little or no formal involvement of unions. The UK trade union movement is only now acknowledging the challenges raised by the environment as a factor in employment, industry and the interests of its members.

UK SMEs vary in their affiliations, some sectors having close contact with trade bodies, local business clubs etc. and others very little contact. In terms of trade associations, the key determinants are the dynamism of the trade association and the quality of the information and assistance that it provides. Some sectors are blessed with active trade associations that carry out research on a commercial basis for their members. Examples include PIRA, the Paper Industry Research Association, the Food Research Association and SATRA the Shoe and Associated Trades Research Association.

3.1.3 Environmental Issues

UK Environmental Performance

The environmental performance of UK industry has in the past been inadequate in many respects, with the 'dilute and disperse' mentality having a considerable influence. The 90's, however, heralded a new era in terms of new environmental legislation. The most important legislation has included The Environmental Protection Act (1990), the Water Resources Act (1991), The Environment Act (1995) and the numerous regulations (e.g. Bathing Waters Regulations, Packaging Waste Regulations) that have implemented key EU Directives.

Overall, the UK has been reactive to pressures from the European Commission rather than proactive, although a very high percentage of Directives have been quickly and effectively enacted by national law. The UK has led in certain fields, for example in the application of Integrated Pollution Control (IPC - soon to be followed EU-wide through the IPPC Directive), in the development of Environmental Management Systems (EMSs) and in the application of energy auditing and waste minimisation techniques. The UK has also led the way in reducing SO_2 and CO_2 emissions from power stations although this has mainly been the result of a commercial switch away from coal to gas fired stations.

Pollution Control

In terms of regulation, the definition of SMEs by size/employment is somewhat unhelpful since most regulation is applied in terms of the consumption of materials or the mass of pollutant discharged. Those that discharge large quantities of dangerous pollutants are regulated by The Environment Agency under IPC, while less significant emissions to air are regulated by Local Authority Environmental Health Officers (EHOs). The Agency also looks after non-IPC emissions to water and waste regulation.

SMEs, therefore, can be 'policed' by either the Agency or the local authority or both. The Agency, while a national body, operates through regional offices. It is also worth noting that discharges to sewer do not fall under the regulators and are only controlled by the limits imposed by the local (privatised) water company.

Below a certain emission or consumption threshold (e.g. 5 tonnes per annum of solvent in printing) authorisation permits are not required. The legislation in fact hinges on the application of Best Available Techniques Not Entailing Excessive Cost (BATNEEC). This is a pragmatic approach that allows emission limits to be applied on a sector by sector and even company by company basis giving due regard to the economic strength of the sector and to the use of the receiving media, e.g. the waters that are to be polluted. In practice these thresholds are set to capture a high proportion of emissions (by total mass) whilst avoiding significant damage to the sector through closures.

In some sectors (e.g. printing) such an approach means that the smallest SMEs do not have to meet certain pollution control standards (e.g. in terms of VOC emissions to air). In other sectors, such as vehicle refinishing, a very high proportion of companies have to be captured due to the dominance of very small and micro SMEs. The vast majority of vehicle refinishers are captured by the 1 tonne per year VOC consumption limit. Other companies are exempt due to the fact that they use harmless or compliant materials. Many printers, for example, go unregulated since they use water-based or other low-VOC inks.

It is also worth noting that the recent Packaging Regulations, which are enforced by the Agency, only apply to companies with a turnover of over £5 million (reducing to £1 million in 2000), excluding many SMEs at present and in the future.

Enforcement

Overall enforcement is reasonably strict although the process of requiring companies to upgrade, through process improvements or the installation of abatement equipment, often involves negotiation. While this approach sounds weak, the authorities take environmental improvement very seriously.

Enforcement is generally quite consistent across the UK with good guidance for inspectors and a standard system of fines and custodial sentences for offenders. Prosecutions are numerous. Consistent with this pragmatic approach to regulation is the application of a 'carrot' in the form of waste minimisation.

Waste Minimisation

To date the regulatory emphasis has been on pollution control rather than minimising resource use, although the more recent regulation often allows companies a material substitution or minimisation option. Many of the smallest SMEs, while collectively responsible for a small percentage of the UK's total pollution load and often unregulated, are more significant consumers of water, energy and raw materials. In many cases, therefore, waste minimisation is of more relevance to small and micro SMEs than pollution control per se.

Fortunately the UK has also been at the forefront with its wide range of voluntary waste minimisation initiatives. The concept of regional waste minimisation came to the UK from Sweden and the Netherlands and has since flourished through various regional schemes such as Project Catalyst, the Leicester Waste Minimisation Initiative, the Deeside Waste

Minimisation Scheme etc. There are in fact around 50 local/regional schemes in operation at present involving several hundred companies, many of them SMEs. It is also worth noting that regional 'environment business clubs' are also now common in the UK with various models being employed around the country. These are effectively support networks.

In addition the UK has a national waste minimisation/clean technology programme known as the Environmental Technology Best Practice Programme (ETBPP). This is funded by both the Department of Trade and Industry (DTI) and the Department of Environment, Transport and the Regions (DETR). The programme publishes sector specific and cross-sectoral guidance, in the form of Good Practice Guides and Case Studies, and runs seminars and training workshops. The Programme runs in parallel with an older Energy Efficiency Best Practice Programme. The two programmes run a combined and free Environment and Energy Helpline and can offer free consultancy advice and even site visits (SMEs only).

Environmental Management

Many companies, including SMEs, have also adopted accredited environmental management systems (EMSs) of one sort or another. These range from the original BS 7750 through the European EMAS and the international ISO 14000 standard. In the UK, the Government has supported the adoption of EMAS in small companies through its subsidised Small Company Energy and Environmental Management Assistance Scheme which paid 40 to 50% of the cost of hiring consultants to help with accreditation. Despite this, uptake was very poor and consequently the SCEEMAS programme has been abandoned by the Government, the funding being diverted into the Environment and Energy Helpline.

In a recent (1998) Groundwork survey of 300 SMEs (Small Firms and the Environment), only around 10% had either ISO 14001 or EMAS certification, almost all of these being medium-sized. Overall there are over 210 companies now with ISO14000/BS7750 certification and around 30 with EMAS certification. Almost all of the companies are medium to large in size with electrical equipment suppliers holding 12% and chemicals, paper/pulp and printing companies holding 10% of the certifications. There are, however, a handful of small printers, including Beacon Press and Bovince, which are certified.

SME Environmental Problems and Performance

Unregulated SMEs, and to a lesser extent regulated SMEs, do make a very significant collective contribution to the overall pollution load. In the past the DETR has stated that the SME sector is collectively responsible for 70% of all pollution although this figure has been disputed. Many SMEs can also cause significant harm to their local environment individually. An electroplater, for example, may use various toxic heavy metals (e.g. cadmium, hexavalent chrome) that could potential cause great harm to aquatic and human life if discharged into a water course. It is also important to note that SMEs collectively are significant and often wasteful consumers of materials and energy, in which respect they are unregulated. Table 3.2 indicates some of the key environmental issues for selected sectors.

Table 3.2: *Key Environmental Issues for Selected Sectors*

Sector	Main Environmental Issues
Printing	VOCs to air and water, solvent/ink waste, substrate waste, packaging waste, energy
Food & Drink	biodegradeable effluents to water, sludges, odours, packaging waste, energy
Speciality Chemicals	various dangerous and difficult effluents to water, VOCs and acid gases to air, chemical wastes and sludges, packaging waste, energy
Textiles	pesticides, dyes, bleaches and biodegradeable matter to water, VOCs to air, toxic sludges, dry fibre wastes, packaging waste, energy
Metal Finishing	heavy metals to water, VOCs and acid gases to air, sludges, packaging waste, energy

In terms of the environmental performance of SMEs per se, there is little data available since analysis tends to be done by sector. As noted already, many of the smallest SMEs are unregulated and hence tend to have poor environmental performance since they have little incentive to improve. Environmental performance amongst regulated SMEs tends to be reasonable in terms of pollution control in that they are required to meet the minimum standards set by law. The waste minimisation picture is not so good, however, and the ETBPP and other support organisations (e.g. Groundwork Trust) are trying hard to address this problem by specifically targeting SMEs.

The savings in water, solvents and materials use achieved by individual firms in waste minimisation schemes suggest that if best practice were to be employed across the SME community of the industries concerned, there would be a substantial environmental impact at national level. Project Catalyst, a Department of Trade & Industry demonstration project, identified potential savings of £8.9 million from 399 waste minimisation measures in 14 large and small enterprises. Even so, only a very small percentage of SMEs are taking advantage of waste minimisation opportunities for the reasons indicated below.

SME Environmental Expenditure

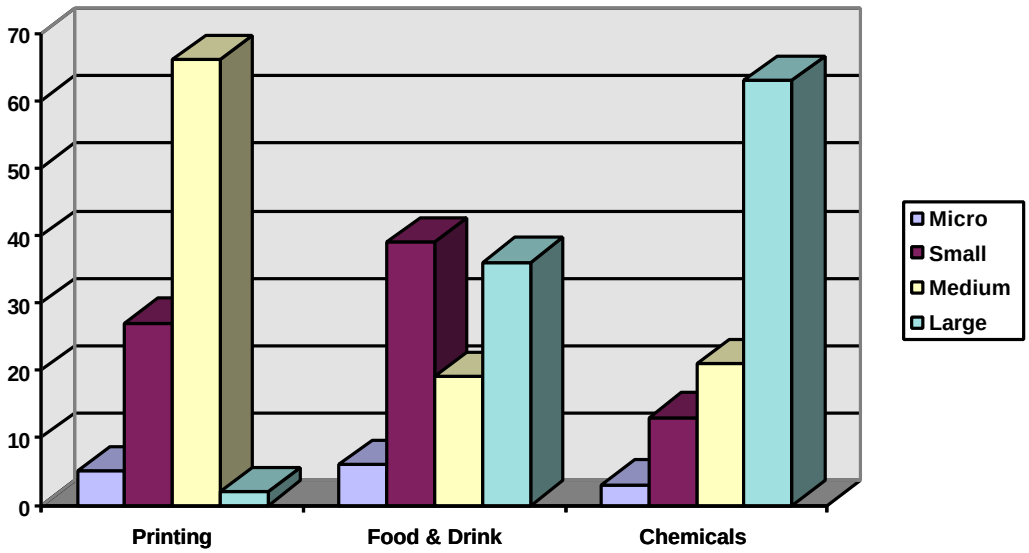
It is useful at this stage to look at environmental expenditure by company size. Table 3.3 below shows percentage environmental expenditure (including capital expenditure and operating costs), as a total of industrial environmental expenditure, by company size for some of the highest spending sectors. Figure 3.2 shows expenditure graphically for the chosen study sectors.

Table 3.3: *Percentage Environmental Spend By Sector/Company Size*

Sector	0-49	50-199	200-499	500+	% of UK Total
Printing	5	27	66	2	3
Food & Drink	6	39	19	36	14
Chemicals	3	13	21	63	21
Plastics	6	23	55	16	4
Textiles	1	80	15	4	4

Source: *DoE Survey - Environmental protection Expenditure by Industry (1997)*

Figure 3.2: *% UK Environmental Expenditure by Company Size in Chosen Sectors*



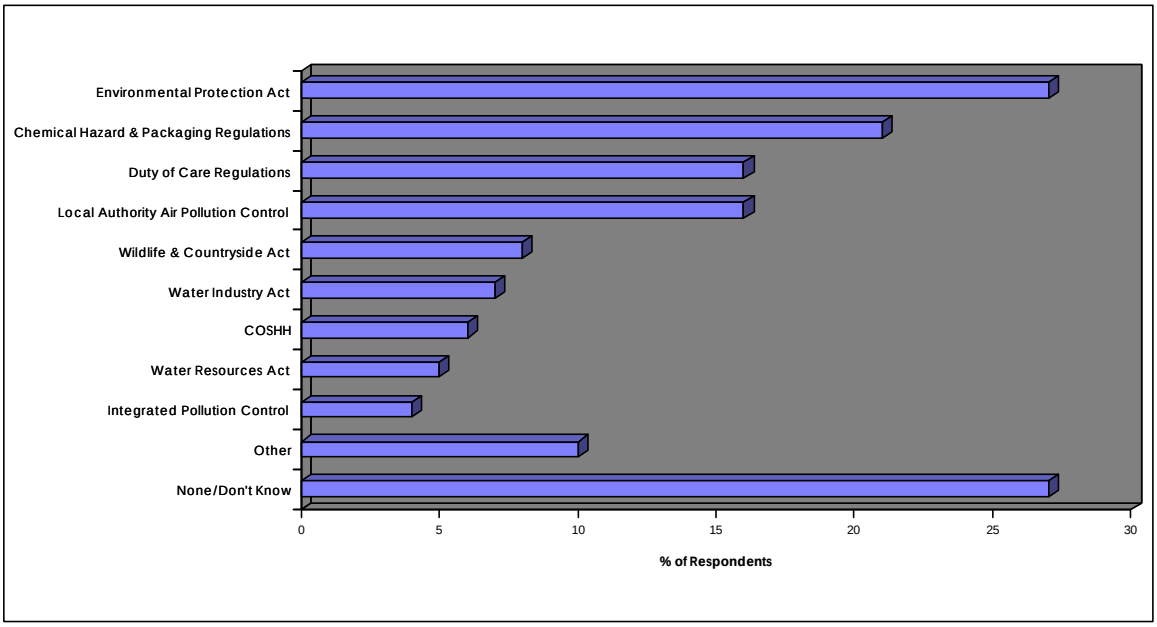
Source: *DoE Survey - Environmental protection Expenditure by Industry (1997)*

While there is considerable variation, it is clear that the small and micro SMEs, despite their large numbers, spend a very small proportion of the total for their sector. The overall figures for the UK demonstrate this since small/micro SMEs spend around 7% of the UK total but produce 16% of the manufacturing output, while medium-sized SMEs spend 18% of the total and produce only 15% of the total manufacturing output. This supports the assertion that the smallest SMEs are under relatively little environmental pressure compared to larger companies.

SME Environmental Awareness

It is also useful to look at environmental awareness. Figures 3.3 (based on 1995 survey work by Gallup for Groundwork) shows that there is very poor awareness of environmental legislation amongst SMEs.

Figure 3.3: *SME Awareness of Environmental Legislation and its Requirements*



Source: *Gallup Survey for Groundwork (1995)*

Only 16% for example were aware of the Duty of Care regulations which affect almost all companies. Similar results have been obtained in the 1998 Groundwork survey of SMEs (Small Firms and the Environment - conducted by MORI). In addition it is our experience that while general awareness of environmental issues (e.g. global warming) is reasonably high, awareness of the detail and the relevance to manufacturing (e.g. impacts of process emissions), is very low.

In terms of awareness of environmental support, the 1998 Groundwork survey produced some worrying results. While 51% felt that they needed practical help to meet their environmental responsibilities, only 3% indicated spontaneously that they would approach Business Link (see below) for support, despite the fact that 43% were aware of Business Link. The organisations most often mentioned in this sense were Local Authorities, the Environment Agency, the DETR, trade and professional bodies and the Health and Safety Executive (HSE), although in each case the percentages were small (the highest being 16% in the LAs case).

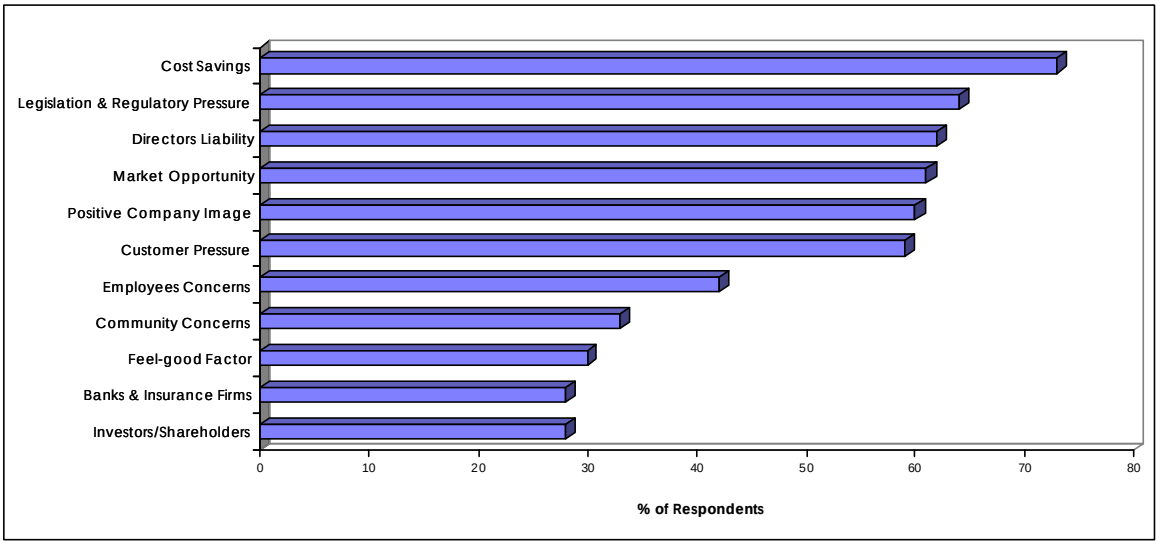
Less than 2% mentioned the ETBPP and it has been our own experience that the programme is still struggling to reach SMEs despite very considerable efforts.

Motivation

Figure 3.4 supports the widely held belief that the main environmental motivators for companies are:

- cost savings (e.g. through waste minimisation etc.);
- regulatory pressure (the need to be compliant);
- customer pressures;
- company image (i.e. customer perception).

Figure 3.4: *Factors Effective in Motivating Companies to Adopt an Environmental Policy*

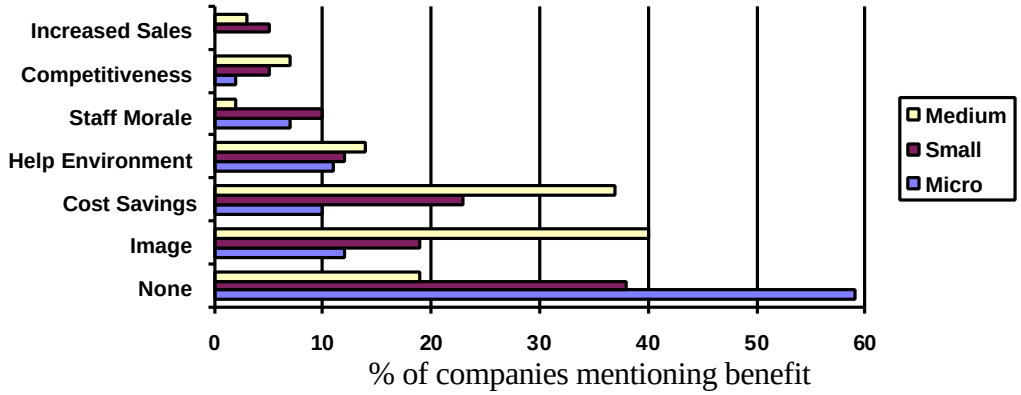


The 1995 CEST (Centre for the Exploitation of Science and Technology) survey on Waste Minimisation and Cleaner Technology, indicated that the main pressures were regulatory (over 70% of companies), community (around 50%), costs (around 40%) and customer related (around 35%). The overall message is clear. Few companies, and certainly very few

SMEs, get involved in environmental improvements for altruistic reasons. While individuals within the company may be 'green', particularly at the middle management level, commercial pressures do not allow anything that is not either mandatory or economically sound (short payback).

Perhaps even more startling is the lack of awareness of the benefits of environmentally-related improvement. Figure 3.5 below shows the results from the 1998 Groundwork survey, indicating that amongst small and micro SMEs, only a small proportion of firms are aware of the potential cost savings and a very high proportion think that environmental improvements offer no benefit to their companies. Given that waste minimisation work in the UK is voluntary, the message is a worrying one.

Figure 3.5*: Perceived Benefits of Improved Environmental Performance*



Source: *Groundwork Survey - Small Firms and the Environment (1998)*

It is clear that supply chain pressure, from large companies down to their smaller suppliers, is becoming increasingly important, particularly in the retail, automotive, aerospace, telecomms, electronics, chemicals and oil industries in the UK. The activity is far from uniform, however, with only a small number of large companies (e.g. British Aerospace, ICL, Rover, Sainsburys) leading the way. This supply chain activity has recently been stimulated by the Packaging Regulations whose shared responsibility approach and data requirements has necessitated supply chain interactions that had been previously very limited if non existent outside the usual purchasing/sales context.

Many of the larger companies, and to an extent local authorities, are now attempting to raise environmental awareness in SMEs and encourage, or even force, the adoption of environmental management systems. The better known examples are B&Q (a home improvement retailer), Rover, BT and Oxfordshire County Council. B&Q for example will not now purchase paint (it controls 50% of the UK retail paint market) from suppliers without an EMS, although the company has come to realise that an EMS alone is not evidence of good environmental performance. The role of large companies in educating and training SMEs is covered in Section 3.5.

It is also worth noting that banks and insurance companies are taking an increasing interest in the environmental performance of organisation which they lend money to and insure. Environmental liability issues are quickly moving up the agenda and some banks (e.g. Nat West) are now conducting risk assessment projects.

Attitudes and Barriers to Waste Minimisation and Clean Technology

Most SMEs in the UK see environmental regulation and improvement as a burden rather than as an opportunity to improve profitability and competitiveness. Many do not identify waste minimisation and the adoption of 'clean technology' with environmental protection as they see it as profit motivated process improvement. Many also believe that they practice waste minimisation when in actual fact they do not, as 'real' waste minimisation initiatives show time after time.

The 1995 CEST survey on attitudes and barriers to the take up of waste minimisation approaches and clean technologies consulted 35 companies, large and small and from a variety of sectors, all of which had been involved in waste minimisation programmes. They found that only 33% of the companies participating were SMEs and of those the vast majority had more than 50 employees.

CEST, and others including ECOTEC and KPMG, have identified the main barriers to waste minimisation, and more broadly environmental improvement, as:

- lack of time/staff resources;
- lack of financial resources;
- lack of investment appraisal capability;
- lack of understanding of environmental problems and risks;
- the lack of understanding of the potential benefits of waste minimisation;
- economic short termism (payback has to be less than 2 years);
- lack of technical expertise/confidence;
- the view of environmental activity as peripheral to the core business;
- initiative fatigue/overload;
- mistrust of other companies in networks/groups.

In their small firms energy savings survey of 1996, The British Chamber of Commerce (BCC) found that from 423 responses gathered, 60% cited lack of management time, 39% cited lack of knowledge and 37% lack of funds as the main barrier. Most small and micro SMEs simply cannot afford to allocate one member of staff to environmental issues and most cannot even spend 2 or 3 days on a course or workshop.

In terms of the key critical success factors, CEST found that for companies involved in group waste minimisation initiatives these were:

- the explicit support of senior managers;
- the availability of financial and operational resource;
- the involvement of an external assessor;
- the use of a project 'champion' or co-ordinator with some environmental responsibility;
- operator involvement backed by immediate and visible management action;
- the 'club' approach.

These points should be seen in the context of companies that are already receiving support through consultants and others involved in the waste minimisation scheme. CEST summarised their study findings as follows:

Cost savings rather than environmental improvement remain the key motivating influence but companies still find it difficult to allocate sufficient human resources. There is no simple solution to the need to stimulate uptake but the attention should be focused on the provision of simple information tailored, as far as possible, to the specific needs of each company.

This statement is particularly relevant in the context of this study.

3.1.4 Summary And Conclusions

Crudely, UK SMEs can be divided into three categories when its comes to environmental performance:

- those that see environmental protection as a burden and a nuisance and will do all they can to avoid regulation and cost;
- those that are committed to being fully compliant in terms of treating end-of-pipe emissions properly but are unaware of the potential benefits of environmental management;
- those that are aware of the benefits of environmental management, waste minimisation and clean technology and see this as an opportunity for improvement.

Our perception is that in the UK most SMEs, in particular the smaller ones, have moved in recent years from the first category into the second. The more pro-active SMEs, which are still by far in the minority, have moved from the second into the third category and many are beginning to achieve real improvements and cost savings. The category makes an enormous difference to:

- how SMEs perceive the role of their staff and their training needs;
- how support should be provided, or at least the starting point for that support.

3.2 The UK education and training framework

The UK higher and vocational training and education framework is complex involving many different initiatives, qualifications and public sector and private sector organisations. Here we will concentrate on those which are involved in, or relevant to, environmental education and training of some kind to provide background information for Sections 3.4 and 3.5.

3.2.1 Academic and Vocational Qualifications

Essentially qualifications are split into two groups, academic and vocational. The academic qualifications include Higher National Certificates (HNCs) and Diplomas (HNDs), undergraduate degrees (BA/BSc) and postgraduate qualifications (MA/MSc/PhD). The most Important vocational qualifications are National Vocational Qualifications (NVQs), or Scottish Vocational Qualifications (SVQs) in Scotland.

NVQs have been devised to improve standards in all aspects of the working environment. They essentially require employees to demonstrate that they have reached certain 'best practice' standards in their jobs. NVQs are offered by numerous organisations in the private sector (e.g. trade associations) and the public sector (e.g. colleges). Various levels of NVQs can be achieved, from Level 1 (the most basic) to Level 5 (for professionals and managers). General NVQs (GNVQs) are also available to young people in full-time education.

The NVQ standards have to be approved by the National Council for Vocational Qualification (NCVQ) while qualifications are awarded by independent bodies, the most important being City and Guilds (CG) and the British Technology Education Council (BTEC). There are many other awarding bodies including the Local Government Management Board (LGMB), the Engineering and Marine Training Authority (EMTA) and the Scottish Qualifications Authority (SQA).

NVQ/SVQs currently cover well over 500 occupations including everything from office jobs, such as admin. and accountancy, through to hands-on jobs such as polymer extrusion or food preparation. Modern Apprenticeships (MAs) are also important in that they formalise the traditional industry apprenticeship system. MAs, designed by the NTOs (see 3.2.2), require apprentices to progress to NVQ Level 3.

3.2.2 Key Organisations

Institutes of Higher Education
Firstly all large towns and cities have at least one Higher Education Institute (HEI - e.g. university) providing degree courses, diplomas and other mainly academic qualifications. The West Midlands has eight major universities, with three in Birmingham. There are also Further Education (FE) colleges (60 in the West Midlands) offering lower level qualifications such as HNCs and HNDs. These provide almost all of the pre-employment education and training.

The Open University, a national body, offers many 'distance learning' courses including degrees, in the main for mature students and those wanting to retrain. Open University courses are taught through the use of TV programmes, video and audio cassettes, residential schools (e.g. one week) and increasingly the internet etc.

National Training Organisations (NTOs)
The NTOs, which replace Industry Training Organisations (ITOs), are sector-based bodies designed to draw together professional bodies, trade associations, trade unions and educational establishments. Any organisation can become an NTO if they meet certain criteria relating to their ability to meet sectoral needs. There are over 100 NTOs including the Food and Drink Qualifications Council and the Chemicals Industries Association (CIA).

METO, the Management and Enterprise Training Organisation, has developed Environmental Management (occupational) Standards which lead to NVQ Level 4. The mandatory units of the NVQ are listed below in Table 3.4. They have also developed Optional Units for use in more general management programmes where a manager may wish to take an environmental option.

Table 3.4: *Environmental management NVQ Level 4 - Mandatory Units*

Unit	***Description***
H1	Evaluate environmental performance and recommend improvements
H2	Gain support and commitment to improving environmental performance
H3	Plan and implement activities to improve environmental performance
H4	Contribute to improvements through work activities
H5	Develop and maintain and environmental policy OR H6
H6	Evaluate and make recommendations concerning an environmental policy
H7	Plan, monitor and support auditing of environmental performance
C2	Develop own resources
	plus two out of 17 optional units

It is also worth noting LANTRA, the NTO for the land-based industries. LANTRA is the NTO to which the Environment Agency belongs and it is also concerned with various aspects of environmental conservation through its Environmental Conservation Industry group. It has no remit, however, in terms of manufacturing industry.

Most NTOs are increasingly involved in the competitiveness debate, looking at issues such as the need for Lifelong Learning, the role of partnerships etc. Amongst other things, NTOs aim to:

- identify skill shortages and training needs at a sectoral level;
- develop occupational standards and NVQs (National Vocational Qualifications);
- develop learning frameworks including Modern Apprenticeships;
- influence and advise on training arrangements and solutions.

As an example, the CIA is about to conduct a major survey of the chemicals sector to gain a better understanding of current training activities and needs.

Training Enterprise Companies (TECs)
TECs act locally throughout England and Wales (their equivalent being LECs - Local Enterprise Companies - in Scotland) to manage/co-ordinate national training schemes (e.g. Investors in People) and promote skills development, gaining commitment from employers and trainees. They receive Government funding to achieve this, although they can also provide services on a commercial basis. For example TECs may bid to provide Training Needs Analysis services to large private sector companies. The West Midlands has 10 TECs, co-ordinated at the regional level.

Business Advisers are the main link with firms, advising on training needs and provisions. Perhaps the most relevant aspect of the TECs work, in the context of this study, is that associated with the new Skills for Small Businesses (SFSB) initiative. This is aimed at companies with less than 50 employees and involves two steps:

- identifying Key Workers to become training champions;
- to establish Company Training Plans to support business objectives and other needs.

The idea is that SFSB is marketed, through TEC Business Advisors, Business Link, local business clubs etc., as a business improvement approach, helping companies to be more systematic in identifying training needs. The initiative also aims to promote NVQs, Open Learning methods, Modern Apprenticeships, the Investors in People standard etc. and to help companies to source the relevant training providers. In general TEC consultants work with the company to help them through the process.

TECs also get involved in all sorts of innovative local projects including those supported by EU funding, for example through ADAPT and Leonardo. In the West Midlands the TEC is leading a World Class Supplier project to encourage continuous improvement throughout the supply chain in the automotive sector. The West Midlands TEC is also involved in the disbursement of a Further Education Competitiveness Fund aimed at priority areas including Electronics, Statistical Process Control, Mechatronics etc.

Business Link

The Business Link (BL, called Business Connect in Wales) network, was set up to provide a one-stop-shop for business advice and in particular for small businesses. Business Link co-ordinates support from various partner organisations including TECs, Chambers of Commerce, local authorities etc. and sources other services as required (e.g. consultancy services). Business Link organisations provide Personal Business Advisors (PBAs) and Specialist Counsellors (e.g. in the field of IT) to assist small companies directly. In theory, BLs should co-ordinate environmental support for small businesses and some have Environmental Management Counsellors/Advisors to achieve this. This environmental role is not mandatory, however, and where BLs have chosen not to fulfil this function they often have to refer companies on to other organisations (e.g. Groundwork - see below)[1].

Business Links have access to the Learning Direct Helpline, a free telephone helpline to advise on national provisions, while most areas have access to some sort of careers service database. The Leicester BL has access to Training Access Point (TAP) which shows all university, college and other public sector provisions in the East Midlands. Similar databases, e.g. showing all NVQs, are available to the TECs.

Professional Bodies

There are four main bodies in the UK for environmental professionals, CIWEM, IWM, IEM and EARA. CIWEM, the Chartered Institution of Water and Environmental Management (CIWEM), is probably the largest (by membership), offering various levels of membership up to Fellow. The organisation has a Royal Charter and links to the Engineering Council. Most of its members are from the environmental sector itself, e.g. the water and waste sectors. Its two most relevant aims are to:

- promote education, training, study and research in order to advance standards and practices within the industry.
- disseminate information through branch meetings, publications, library facilities, special interest groups, conferences and networking between members.

[1] The Government has announced that a new national Small Business Service will be funded in part to help improve the quality and coherence of Business Link services. It is as yet unclear as to how this will manifest itself.

The IWM, the Institute for Waste Management is aimed at professionals in the waste sector specifically and again offers various levels of membership. It is also worth noting that there is also an organisation called the Waste Management Industry Training Board (WAMITAB) which provides Certificate of Technical Competence (CoTC) to those in the waste industry holding waste management licences.

The Institute for Environmental Management (IEM) aims to offer professional status to those with environmental duties but who are not necessarily involved in the environmental sector per se, e.g. those in manufacturing industry. The IEM offers a foundation certificate (3 day introduction to EMS) and a range of memberships from affiliate, through associate (AM-IEMgt) to full member status (M-IEMgt). The associate membership requires an assessment or some sort of accredited environmental training (taking many full and part-time forms) to have been undertaken. The full membership requires a certain level of experience (3 years minimum) and involves an assessment of professional ability. The IEM now has over 1000 members (some in SMEs) and around 120 full members and provides similar services to CIWEM (e.g. journals, meetings, events etc.)

The Environmental Auditors Registration Association (EARA) is not a full professional body in that it mainly provides a registration service for those that have completed EARA approved auditing courses. There is the possibility that EARA will merge with the IEM in the near future. It is also worth noting the Chartered Institute of Environmental Health specifically for Environmental Health Officers (see Section 3.4.2).

In addition to the environmental bodies there are also, of course, professional bodies for most disciplines, well-known examples being the IMechE (Institute of Mechanical Engineers) and the IChemE (Institute of Chemical Engineers).

Other Organisations

In terms of environmental education, training and support, other key organisations include not-for-profit concerns such as Groundwork, Business Environment Associations (BEA), Business in the Environment (BiE) and local environment business clubs such as the Midlands Environment Business Club (MEBC) and Staffordshire Business Environment Network (SBEN).

Of these Groundwork is probably the most important player in terms of direct SME support. Groundwork was set up in Birmingham in the main to provide land remediation and landscaping services. There is now a large national network of Trusts in the more industrial areas of the country funded through various means. Many Groundwork branches (e.g. Black Country in the Midlands) provide Environmental Business Services. These services include an Environmental Review Scheme for small companies which involves environmental specialists spending short periods with companies (usually no more than a few hours) and producing a report with waste minimisation recommendations.

The BEA began in the East Midlands and is now also developing a national network with regional offices in the English Midlands, Northern and Southern Regions. Through their Enviro-Mark process, the BEA aims to assist SMEs in developing accredited environmental management systems. Various levels of EMS are defined from Bronze (compliance only) to Diamond (equivalent to ISO14001). The organisation is partly-funded by sponsors including large UK companies such as British Airways, Vauxhall Motors and Asda.

BiE is a national organisation, established in 1989 at the request of HRH The Prince of Wales. The aim is to encourage business leaders to assess and improve the environmental performance of their companies. This is done through awareness raising and the provision of handbooks (e.g. the DIY Environmental Review for Companies, Buying into the Environment - the latter relating to supply chains). The BiE works closely with the Environment Agency and has helped to disseminate the Agency's 3Es waste minimisation methodology (Emissions, Efficiency and Economics).

BiE have also been involved in training Business Link Personal Business Advisors (PBAs) with regard to environmental matters. One of the most significant areas for BiE has been the development of the Index of Environmental Engagement (ten key indicators) for large corporates quoted on the stockmarket. It is fair to say that BiE has had more to do with large companies than SMEs although BiE is currently involved in establishing an environmental network of support organisations in the Midlands.

3.2.3 New Initiatives

The University for Industry (UfI) is a new and important initiative for open and distance learning, basically acting as a broker and commissioning body. UfI aims to bring training and education, so-called lifelong learning, into the workplace and the home, through IT technology, a telephone helpline and a network of franchised Learning Centres, to allow reskilling to take place more readily than at present. Pilot UfI projects will be run up to the year 2000 through the EU ADAPT programme in the UK and thereafter will be fully operational. The UfI programme has selected environmental training for SMEs and individuals as a priority area, together with business skills training for suppliers of environmental goods and services.

The Government has announced that a new national Small Business Service (SBS) will be funded (£100m over three years) in part to help SMEs comply with regulations and in part to improve the quality and coherence of Business Link services. It is as yet unclear as to how the SBS changes will manifest themselves. The Government also intends to introduce Individual Learning Accounts (ILAs) (piloted this year and in full effect from 2000), whereby all individuals will be given discounts on eligible courses and employers will be given tax relief on their contributions. Finally it is worth noting the Investors in People (IIP) standard, a recent initiative aimed at improving staff training and development in organisations through taking action to improve procedures, providing evidence of these actions etc.

3.3 SME environmental education and training needs

3.3.1 Introduction

The advance of environmental protection in the UK over the last ten years has certainly resulted in changing roles, skill/competency requirements and the need for environmental education and training. In practice the skill changes required have generally been approached as a management matter on a firm by firm basis. There has been very limited strategic planning although this is now changing through the work of the NTOs.

Within SMEs, the approach and attitude to environmental training has mirrored the attitude to environmental improvement; i.e. there has been a range of responses to real and perceived requirements. Unfortunately there have been, and still are, a number of barriers to the uptake of environmental education and training.

It should be noted that the discussions that follow are largely drawn from the company case study material of Annex 1, supported where appropriate by additional observations based on ECOTEC experience and the available literature.

3.3.2 Environmental Duties, Responsibilities and Roles

Across many UK industries, the last ten years have seen extensive restructuring, reductions in employment and reorganisation of tasks, eliminating some of the constraints to changing job specifications and multi-tasking.

The study work has identified that most of the consultees believe that environmentally-related pressures have resulted in new roles and multi-tasking for existing employees. For example, at least one person on most manufacturing sites has to take responsibility for some or all of the following:

- Environmental Compliance (including Packaging Regulations)
- Health and Safety Compliance
- Waste Disposal (Duty of Care)[2]
- Wastewater Disposal/Treatment

In most of the smaller SMEs, multi-tasking has been the usual outcome, with environmental duties and responsibilities being additional to regular management and manufacturing jobs such as technical director, site chemist, production manager etc. In general, specific and direct environmental responsibilities only tend to affect a handful of employees, mainly at the more senior management level.

Only in medium-sized SMEs is environmental responsibility delegated to more dedicated middle managers. In larger SMEs it is quite common to find a Health, Safety and Environment Manager who has had the environmental duties tacked on to the original Health and Safety duties. This individual, or another middle manager, may also be given responsibility for establishing an Environmental Management System (EMS).

Very few firms see the shopfloor staff as having any sort of 'environmental' responsibility other than perhaps for waste disposal, although in part this is the result of the typically narrow interpretation of what is meant by environment, for example excluding waste minimisation through correct machine operating procedures.

In general, environmental roles are seen as being additional rather than integral to existing 'core' roles. In addition, only the more direct and obvious roles are seen as having any relevance to environmental improvement while in fact environmentally-related responsibilities cut across many disciplines and job functions including:

- Purchasing (of materials)
- Finance (e.g. of clean technologies)
- Sales and Marketing (influence on design, customer feedback)
- Product and Packaging Design
- Goods Receiving/Warehousing

[2] Those holding waste management licences (usually in the waste industry rather than manufacturing industry) have to obtain a Certificate of Technical Competence (CoTC) from the Waste Management Industry Training Board (WAMITAB).

- Production Management
- Process Operation/Chemistry
- Plant Maintenance
- Goods Distribution (e.g. haulage)

While managers and others may have some responsibility for the above activities, they do not tend to appreciate the potential for environmental improvement and/or cost saving embodied within these roles. Interestingly, in the better firms, where modern management techniques are employed, environmental considerations are simply one aspect of quality management and operational efficiency, being integrated into the whole company ethos and into almost every role and aspect of decision making. Quite rightly, therefore, environmental education and training is seen in these firms as part of the mainstream training process, being integrated into all aspects of management and shop floor training.

It is worth noting that EMSs, like ISO 14001, facilitate this systematic integration process and hence play an important role. This has been the case at one of the case study companies, Applied Chemicals, although it has to be noted that there are good, proactive SMEs that have not gone down the EMS route and conversely companies with an EMS that are not achieving significant environmental improvements.

Job profile – Operations Director (Ethiprint – printer)

Environmentally related responsibilities:
- production management
- environmental compliance
- plant specification
- process operation
- waste disposal

Environmental skills and competencies - some knowledge of:
- current environmental impacts, issues and regulations
- waste minimisation benefits, techniques and measures
- abatement techniques
- process optimisation and clean technology
- proper process equipment use.

Further skills/competency requirements - knowledge of:
- green purchasing
- environmental management systems
- waste minimisation techniques and measures
- energy efficiency techniques and measures
- process optimisation and clean technology

3.3.3 Environmental Skills and Competencies

If companies are to benefit from environmental improvement, they require skills and knowledge in many, if not all, of the following areas:

- Regulatory Requirements (environmental law);
- Environmental Impact Awareness
- Monitoring Techniques;
- End-of-Pipe Abatement Technologies;

- Environmental Review/Auditing;
- Environmental Management Systems/Frameworks;
- Energy Efficiency Techniques and Measures;
- Waste Minimisation Techniques and Measures;
- Statistical Analysis Techniques;
- Design for the Environment;
- Process Optimisation/Clean Technology;
- Green Purchasing (products and materials);
- Environmental Investment Appraisal.

Clearly not all companies will need all of these to the same degree. For example, some companies do not design/specify their own products and hence do not need to know much about design for the environment. However awareness of the downstream impact of the product they make may allow them to re-examine the process and make recommendations to their customer that may save everyone money and reduce the environmental impact. Clearly not all skills and competencies need reside in one individual. In fact it is generally desirable for these skills and competencies to be shared as appropriate amongst the various relevant jobs.

Job Profile - Dairy Manager (Tuxford and Tebbit – Food)

Environmentally-related responsibilities:
- plant maintenance
- plant specification
- process operation
- environmental compliance
- waste disposal
- wastewater monitoring

Environmental skills/competencies - some knowledge of:
- current environmental issues/regulations
- environmental impacts
- waste minimisation benefits, techniques and measures
- staff motivation and communication
- abatement technologies and techniques
- environmental management system
- energy efficiency techniques and measures
- process optimisation and proper process equipment use
- data analysis
- monitoring and analytical techniques

Further skills/competency requirements:
- strengthening of the above.

Interestingly, five of the companies consulted did not believe that core skills/competencies had changed in recent years due to environmental pressures, although most managers seem to believe that they have a wide range of environmental skills and competencies which presumably they have not always had. Again it appears that most companies see the environmental skills and competencies as an add-on rather than something integral to various core roles. Only one of the companies, the larger chemicals company, believed that core skills/competencies had changed directly as a result of environmental pressures.

In terms of environmental skills/competencies the most commonly noted areas were: current issues;

- impacts;
- waste minimisation/energy efficiency benefits;
- pollution control equipment;
- EMS frameworks;
- energy efficiency techniques;
- waste minimisation techniques;

Perhaps as would be expected, the least-noted areas were:

- design for the environment;
- green purchasing;
- investment appraisal techniques;
- monitoring techniques;
- data analysis.

Job Profile - Quality Assurance Manager
(Taylor Bloxham - Printer)

Environmentally-related responsibilities:

- environmental compliance
- health & safety compliance
- waste management/disposal
- noise monitoring/control

Environmental skills/competencies - some awareness of:

- current regulations and issues,
- environmental impacts
- waste minimisation benefits
- design for the environment
- environmental auditing and management systems
- energy efficiency techniques
- waste minimisation techniques
- process optimisation

Further skill/competency requirements:

- green purchasing
- monitoring and data analysis

Job Profile - Process Operator
(Caswell& Company - Chemicals)

Environmentally-related responsibilities:

- process operation and chemistry
- waste disposal
- control of emissions to air

Environmental skills/competencies - some awareness of:

- regulations and current environmental issues
- waste minimisation benefits
- abatement technologies and techniques
- energy efficiency measures
- process optimisation.

Further skill/competency requirements:

- improved knowledge of environmental impacts, practical waste minimisation

3.3.4 Environmental Training and Education

Needs Analysis, Plans and Budgets

Any form of systematic or formal Training Needs Analysis (TNA) is very rare in UK SMEs and in particular amongst the smaller SMEs. Of the companies consulted in this work, none had carried out any formal training needs analysis for the company as a whole, although four of the six had general staff development/training plans. Only one company had environmental

objectives as part of its training plans. Only one company was working towards the Investors in People (IIP) standard. Five of the six companies had a training budget although none had a specific amount set aside for environmental training.

Like most aspects of SME business, training is done reactively in an ad-hoc rather than planned way. Worryingly, few companies actually understand what is really meant by TNA and the benefits of it as part of a systematic planning process to upgrade skills and competencies. Perhaps not surprisingly then, companies do not feel they need assistance with identifying their needs.

Recruitment, Qualifications and the Environmental Manager

An increasing number of SMEs are training/recruiting staff with environmental qualifications to fulfil the 'additional' environmental roles. Three of the case study companies have, or are soon to, employ a member of staff with an environmental qualification in the form of an MSc, Diploma or NVQ. Only one, however, is actually recruiting an Environmental Manager, the other two having allowed or encouraged existing staff to obtain qualifications whilst still at work.

In two of the case study companies, staff have voluntarily completed environmental masters degrees. Interestingly, most employers do not see qualifications per se as being important, other than to satisfy staff ambitions. What they are looking for is the competence and, in the case of recruitment, proof of that competence. It is interesting to note that some companies recruiting environmental managers now specify that the individual should be an associate member or member of one of the relevant professional bodies, CIWEM, IEM or EARA (see below).

While there is certainly a need for environmental specialists with the relevant qualifications, there is also a need for integration of environmental considerations into most SME jobs as noted already. One of the case study companies, Caswell and Company, have done just that, recruiting for core skills and then training these staff in the additional environmental competencies.

It is important to note that having a specialist Environmental Manager, recruited or otherwise, can mean that the more integrated approach is ignored. Having an Environmental Manager in some cases is seen as being the total solution, not part of it. In fact an Environmental Manager should be just the right person to assist with the internal environmental education and training of other non-environmental staff.

Perceived Needs and Current Choice of Provisions

Most companies have a fairly clear idea of what they require in terms of the characteristics of the education and training provided. All 6 of the companies consulted want training, education and information provision to be:

- low cost (e.g. no more than a few hundred pounds for a course);
- modular and flexible;
- concise as specific as possible to their sector/problems;
- easy access; on-site/local or via a telephone helpline.

These preferences are reflected in the types of training provisions being used, these being as follows in the case study companies:

- ad hoc on-the-job training;
- self-help, in the main through literature, computer disks, video;
- seminars and workshops;
- modular courses, on-site or day release;
- distance/open learning;
- internal dissemination meetings/seminars.

Interestingly none of the companies noted Modern Apprenticeships. In terms of self-help computer material it is worth noting that most of the companies we consulted do have at least one computer with CD-Rom, internet access and other appropriate software including spreadsheet and database software.

In the main companies are accessing training relating to:

- environmental regulation (in particular the Packaging Regulations of late);
- environmental management (e.g. ISO 14001 related courses);
- waste minimisation.

The sources and providers of environmental education and training material have included:

- trade journals and other commercial publications (e.g. Croners);
- trade associations (BPIF, BACS);
- DETR/DTI/Environment Agency;
- TECs/partnerships (as facilitators);
- British Safety Council;
- Business Environment Association;
- Environmental Technology Best Practice Programme (ETBPP);
- Business Link (contacts only);
- local authority;
- Open University;
- consultants (EMS)

By far the most popular sources are the trade journals and other publications (all six companies noted these), the trade/research associations (four companies noted these) and the 'authorities' in terms of the DETR, DTI and the Environment Agency (again four companies noted these). Most other providers have been used by only one of the six companies. Unlike other parts of Europe, the trade unions are playing virtually no part at all in the provision of environmental education and training.

While a small sample, this result ties in with a survey by the UK Advisory Committee on Business and the Environment (ACBE) which found that 60% of respondents cited the trade associations as the most important source of information with the Government some way behind on 20%. This does however conflict with the 1998 Groundwork survey which found that trade associations came after the local authority, the Environment Agency and the DETR in terms of support organisations most often mentioned. It should be noted, however, that close to 40% of SMEs had not contacted any organisation.

While most companies feel they would benefit from additional environmental education and training, most are actually happy with the types of provisions they make use of. Some noted, however, that many of the seminars etc. that are available are too expensive, usually not local and often of too general a nature.

Few feel that they need assistance with finding appropriate provisions/support although it is our experience that very few SMEs have a good awareness of what provisions are available, even in terms of free literature, workshops and seminars from Government support programmes such as the ETBPP.

3.4 The education and training needs of the regulatory agencies

3.4.1 The Environment Agency

Roles and Qualification Requirements
The main environmental regulator in England and Wales is the Environment Agency which deals with most aspects of industrial pollution control, water resource issues, flood protection, conservation etc. The organisation employs hundreds of staff in eight regions. The main areas of employment fall under:

- Environmental Strategy, including monitoring, information, R&D. Mainly employing university graduates in the following disciplines:- environmental sciences, chemistry, engineering, economics, ecology.
- Flood Defence. Mainly employing project managers and engineers (educated to degree level or beyond) and technicians (qualified to HNC/HND level or beyond).
- Water Resources. Mainly involving hydrology and hydrogeology and employing earth scientists, geographers and geologists as well as specialists;
- Pollution Prevention and Control, including Water Quality, Pollution Inspection, Waste Regulation. Mainly employing staff with science, environmental science and engineering qualifications (usually to degree level) and experience in field work, industry, waste management etc.
- Fisheries, Recreation, Conservation and Navigation. Mainly employing biologists and other appropriate qualifications (e.g. Diploma from the Institute of Fisheries Management).
- National Laboratory Services. Mainly employing degree level chemists, micro-biologists etc. and lab. technicians educated to HNC/HND level or above.
- Finance and Internal Audit. Mainly employing those with business studies degrees, graduate accountants etc.
- Corporate Information Services, including a wide variety of jobs from computer programming, through customer help desks, to telemetry. Mainly employing graduates.
- Research and Development. A small team of R&D co-ordinators all with an Environment Agency background.
- National Service for Waste Minimisation and Prevention. Employing key Agency staff and regional facilitators, all educated to degree level (see below).
- other areas including legal services, corporate planning, corporate affairs, personnel, training and education (see below).

Internal Training

The Agency, which was only established in 1996, is well-organised and has its own internal training organisation (National Training Service). While the Agencies training activities are still developing, it aspires to a demand-driven programme based on the identification of corporate business needs and competency requirements, i.e. rigorous training needs analysis (TNA).

Competencies, both technical and otherwise (e.g. communication skills, customer care etc.), have been defined for many of the jobs/functions (these being uniform across the regions) although the process is not yet complete. Competencies are defined in a similar fashion to NVQ competencies.

Most staff are educated to degree level and beyond and most of the training is to educate staff in terms of their specific duties, new regulation etc. Some of the training is carried out internally, often involving Agency specialists, for example in environmental management systems, waste minimisation, monitoring etc. who take on a training responsibility as part of their job or are actually seconded to the National Training Service. The Agency is also in the process of establishing relationships with external training providers.

The training courses generally take the form of short, taught courses given at regional or national level. While these courses are designed to meet the needs of those at which they are aimed, the demands of the organisation mean that it can be difficult for officers to fit in their regular training courses and fulfil their regular duties. NVQs themselves are used to provide manual workers with some form of framework in which to develop and obtain qualifications.

External Education

The Agency now has an Education department concerned with external education of the public and companies. This has come out of a desire to be seen as a support organisation rather than just 'the enemy' (i.e. the regulator). Much of the work is aimed at awareness raising, for example there is a current campaign to improve public understanding of sea pollution and in particular the differences between natural occurrences (algal blooms) and man-made occurrences (sewage). Eight new regional Education Co-ordinators have recently been appointed to support this activity.

Education of companies has also moved up the agenda. While enforcement officers have always been helpful with regard to making waste prevention suggestions etc., efforts are now being made to formalise the education process. As a result there is a new National Service for Waste Minimisation and Prevention, which in the main is educating Environment Agency staff to educate companies, in particular regulated companies. Within this department there are advisors dealing with guidance, prevention/minimisation and SMEs. Workshops and seminars have also been organised at the regional level, often co-ordinated with the Environmental Technology Best Practice Programme (ETBPP).

3.4.2 Local Authorities

Local authority Environmental Health Officers (EHOs) have to be educated to degree level through a specific four year Environmental Health Course. This involves one-year work experience during which a log book must be kept. The individual can then become accredited through the Chartered Institute of Environmental Health and hence get a full time job.

Ongoing training/information is provided through the Institute Newsletter and update courses (provided by the Institute). Information concerning new regulations, procedures etc. is also provided through specific documentation and discussed at meetings.

3.5 Provision of environmental education and training

3.5.1 Overview

Although the process may be different from some other Member States, positive environment-related skills changes are nonetheless taking place. As already noted, the UK has been among the leaders in the development of environmental management systems (EMS) and waste minimisation initiatives, attempting to improve environmental performance and the competitiveness of UK industry at the same time. This activity, combined with pressure from regulators and customers, has led to a substantial demand for environmental education and training.

At the same time, higher education institutions and a range of private and voluntary sector training providers have seen 'environment' as a whole new market area, bringing the opportunity to attract more students and funding. While fifteen years ago there was only a handful of environmental science courses available, now almost every university offers either an BA/BSc and/or MA/MSc in some sort of environmental discipline. In now appears, in fact, that higher education courses currently generate a supply of graduates which exceeds demand.

As already noted, there is also a national system of vocational qualifications (NVQs) which include an NVQ for environmental management, another for waste management and other environment-related NVQs. There is also a sizeable industry devoted to practical job-related environmental training, this involving various private sector organisations (e.g. Aspects International, Environ), not for profit organisations (e.g. Groundwork Trust, Business Environment Association) and Government initiatives and schemes (e.g. the ETBPP). There is now a plethora of courses, workshops, seminars, publications etc. dealing with many aspects of pollution control and, in particular, environmental management.

The sections that follow concentrate on the more innovative and SME-focused provisions that are of most interest to this study.

3.5.2 University and College Activities

Regular Courses

As noted above, there is a huge range of full-time, part-time and sandwich courses available from UK universities. In the Midlands alone the Universities of Aston, Birmingham, UCE, Nottingham, Warwick and DeMontfort all offer several undergraduate and postgraduate courses. Wolverhampton University offers 10 environmental courses (from HNC to MSc) while Birmingham University offers thirteen environmental courses of one sort or another.

Overall there is still a bias towards more general 'soft' environmental science, management and conservation, often reflecting the competencies of the lecturers in the various geography and biological science departments that tend to run the majority of courses. In recent years, however, there has been a move towards now more technical courses concerned with:

- environmental management for industry and business;
- environmental technology and engineering (e.g. UMIST, Birmingham, Wolverhampton).

It is interesting to note that some business schools (e.g. Hertfordshire, see below) are running environmental management courses in conjunction with other university faculties (in this case Natural Sciences). In addition many of the traditional subjects are now offered with an environmental bias, for example Civil Engineering with Environmental Management (Birmingham). It is also good to see that industry and other work placements are becoming more common as element of courses (e.g. UCE).

Some of these newer courses have attracted funding from TECs and other organisations and programmes (e.g. ADAPT) as they are seen as filling a current skills gap.

Distance and Open Learning

Fifteen years ago open and distance learning courses were very few and in the main run by the national Open University. In recent years, distance and open learning have become far more common. The University of Hertfordshire, for example, runs a distance learning course for business (see Box 3.1 below) while the University of Wolverhampton runs a part time/distance learning MSc which has involved staff from local SMEs. The 'Design for Environment Research Group' at Manchester Metropolitan University offers a new distance learning package in Life Cycle Assessment (LCA).

DeMontfort University has a Distance Learning Centre which offers 3 environmental courses: a Post Graduate certificate (PgC) in Environmental Quality Management, a BSc in Water and Environmental Management and a Diploma in Environmental Protection. All of these courses are delivered using:

- 4 one-day tutorials;
- 4 weekend residentials;
- reading material and 4 written assignments;
- examinations.

The courses are aimed at middle-management and technical staff. DeMontfort are moving towards greater use of electronic media (CD-ROM, E-Mial etc.) to make the course delivery even more flexible.

As noted in Section 3.2, The new University for Industry (UfI) will also promote distance and open learning for industry, acting as a broker and a commissioning body, operating in conjunction with Business Link, TECs etc.

Box 3.1: *Environmental Management for Business - Hertfordshire University*

Qualification:
- *MSc or Diploma*

Aimed At:
- *Managers and Technical Staff*

Course Structure:
- *modular - 7 x 120 hour courses plus a project;*
- *distance learning using information pack;*
- *10 weeks per course with one Friday/Saturday taught element;*

Courses Content:
- *Environmental Management and Business;*
- *The Environmental Review;*
- *Environmental Effects Assessment;*
- *Policy Development and Implementation;*
- *Integrating Environment into the Business Strategy;*
- *Integrating Environment into Local Government;*
- *The Environmental Audit Process*

Taught By:
- *professionals - consultants, local authority people etc.*

SME Specific Courses

Some universities have begun to understand that SMEs have special needs, in particular relating to resource constraints etc., and have developed SME-specific courses and centres. Birmingham University, for example, has a specific Working with Local Industry programme involving courses, workshops and seminars. The programme is supported by the EU-funded Accelerate programme (see below), the Business to Business Exchange and Birmingham City Council.

It is interesting to note the differences between this seminar series and the content of the Hertfordshire Business School course, the latter being far more strategic, this being far more practical and oriented towards regulation and cost saving.

The key here has been developing contacts with local businesses over a long period of time and offering low cost and carefully targeted material that involves the regulators (Local Authorities and the Agency).

Box 3.2: *Working With Local Industry - Birmingham University*

Qualification:
- certificate leading to Diploma/MSc

2 Programmes:
- Supply Chain Development Programme
- Environmental Awareness - Training the Trainers
- both involve a series of one-day seminars plus work-based exercises

Aimed At:
- all - from shopfloor to managers

Supply Chain Programme Content:
- Waste Minimisation;
- Packaging Regulations;
- Local Authority Regulation;
- Continuous Improvement for Env. Management;
- Waste and Energy - Management and Minimisation;
- Waste Discharge and Pollution Control;
- Environmental Auditing, Objective and Target Setting.

Taught By:
- University staff, Environment Agency, local authority people, etc.

3.5.3 National Vocational Qualifications

The UK system of NVQs/SVQs, for example as awarded by City and Guilds, covers a wide range of occupations/subjects including:

- Environmental Management;
- Waste Management Operations;
- Sewage and Water Treatment Supervisors;
- Energy Efficiency;
- most production processes, including Printing, Food and Drink Manufacturing Processes (general), Brewing etc. .

The degree to which the regular production process NVQs cover environment is difficult to assess, although some are believed to cover the basics of waste minimisation in the sense that they cover correct equipment use etc. Having spoken to some of the providers (e.g. the British Polymer Training Association - BPTA), coverage of environmental awareness, regulation etc. does not yet appear to be that common, most courses sticking to the core skills.

3.5.4 Trade/Industry Organisations

Trade and industry organisations play an important role in UK environmental training and education through providing a wide range of self-help material, seminars and courses. Many small companies rely quite heavily on their associations to inform them of statutory responsibilities etc.

Some sector organisations are better than others, the research associations (e.g. for the shoe industry and paper industry) being amongst the best. Some typical provisions of relevance to the sectors under consideration are noted below in Box 3.3 by organisation.

Box 3.3: Trade/Industry Organisation Activities

British Association of Chemical Specialities and British Printing Industry Federation
- seminars and workshops, for example:
  - Packaging Regulations, waste management Duty of Care;
  - delivered by sector experts, on-site if required.

Food Research Association
- 1, 2 and 5 day courses in ISO 14000 (part of range of quality related courses);
- no assessment, no qualification - certificate only;
- taught by technical and management staff, on-site if required.

Engineering Employers Federation
- Environmental Management Certificate Course;
- 2 one week modules, in-company if required;
- leads to associate membership of Institute of Environmental Management (IEM)

While not an industry association as such, the British Safety Council (BSC) is another cross-sectoral provider of note. As noted in one of the case studies in Annex 2, the BSC provides modular short courses (e.g. Diploma in Environmental Management), delivered at the company premises, based around workshops, case studies, expert lectures etc.

3.5.5 Professional Bodies

As already noted, there are professional bodies for those in the environmental sector and for those with environmental responsibilities, these including the Chartered Institution for Water and Environmental Management (CIWEM), the Institute of Waste Management, the Institute for Environmental Management (IEM) and the Environmental Auditors Registration Association (EARA).

In terms of provisions, most of these bodies have aimed to raise the standards of environmental training through a process of accreditation. Accredited courses both award certificates, diplomas etc. and lead to various levels of membership status. CIWEM recently launched a new range of modular courses to be run by various colleges and universities around the country. IWM offers short courses specifically for the waste industry, although some courses are of relevance to those in general manufacturing.

Of the other professional bodies several offer training courses and other materials. the Institute of Chemical Engineers, for example, offers several self-help training packages including manuals & videos, often using with case studies. These packages cover such topics as waste minimisation, designing for cleaner technology and EMS.

3.5.6 Environmental Technology Best Practice Programme (ETBPP)

Since 1995, the Government-funded Environmental Technology Best Practice Programme (ETBPP) has been a major player in the environmental education and training scene in the UK through the provision of:

- self-help Good Practice Guides, case studies, computer disks;
- workshops and seminars;
- an Environment and Energy(telephone) Helpline;
- limited one-site consultancy advice.

All services are free. There are now over 200 guides and case studies covering everything from solvent use in the printing sector to investment appraisal. In terms of the workshops and seminars, half-day events are held on specific subjects at various regional venues around the country. Recent events have covered water use in the speciality chemicals sector and packaging minimisation. It is estimated that the ETBPP is helping UK businesses to achieve savings of around £50 million each year. To date the helpline has been able to offer advice and information to over 80,000 callers and last year over 300 SMEs took advantage of free on-site counselling visits.

The ETBPP is complemented (actually preceded) by an Energy Efficiency Best Practice Programme, which provides very similar services on the energy side, and by a DTI programme called Biotechnology Means Business (BMB), which has recently bean relaunched as Bio-Wise. While not specifically aimed at environmental improvement, many of the publications and events (e.g. seminars) relate to waste and wastewater treatment.

3.5.7 Other Business Support Organisations

As noted already, the key business support organisation is Business Link although often they have limited in-house environmental expertise and have to work in partnership with other organisations. In the West Midlands, Business Link has specialist environmental advisors while in Staffordshire Business Link makes use of Groundwork and SBEN (see below). Business Links are not usually directly involved in providing education and training, however they do facilitate, for example by supporting ETBPP and Environment Agency workshops and other regional activities.

The Environment Agency is also getting more and more involved in company 'education' through its active involvement in waste minimisation schemes and other business support initiatives, often working in partnership with local authorities, the ETBPP, Business Link, BiE etc.

Groundwork and the Business Environment Association (BEA) are also important players, although Groundwork is more involved in training than the BEA which mostly provides EMS support. As an example, Groundwork Stoke on Trent has developed a modular environmental management training course - six, fortnightly sessions (6 to 9 p.m.) to train company staff to a CIWEM accredited standard. The first programme involved 15 'students', many from the ceramics sector. They are now into the second 'run' of the programme and have funding through ESF and Objective 2/4.

The organisation is now developing specific ISO14001 courses using ESF funding.

Groundwork in the South West (Plymouth) runs an interesting SME waste minimisation training programme called PAYBACK. Typically 6 to 12 companies take part in each course which comprises 6 modules held at around 6 weekly intervals. Each module lasts about 4 hours and is broken down into a training session and a discussion period. With each module the participants are taken one step further through the process of putting in place a waste minimisation programme or EMS, and at the subsequent meeting they discuss progress and problems. The firms taking part come from a range of industries, experience having shown that this stimulates the exchange of information and ideas.

There are also numerous local environment business clubs around the country that provide, for example, evening seminars on topical issues (e.g. regulation), newsletters and educational

visits (e.g. to waste and water treatment facilities). Interestingly the Midlands Environment Business Club (MEBC), one of the better clubs, is currently conducting a Training Needs Analysis survey to establish environmental training needs in school children, adults and businesses so as to better focus its activities.

The Staffordshire Business Environment Network, supported through membership subscriptions, council and ERDF/SRB funding, falls somewhere between the MEBC and Groundwork, providing:

- 1 day training courses (e.g. environmental management);
- short seminars on key themes (e.g. Packaging Regulations);
- a local Environmental Helpline;
- subsidised consultancy.

Business in the Environment (BiE) in the Midlands helps to facilitate such activities and is involved with establishing a co-ordinated network for such organisations. Along with the MEBC, BiE is also involved in establishing an SME environmental support strategy for the region and an 'environmental council' to help co-ordination. This should help to reduce the existing overlaps in provisions and activities, making projects more cost-effective, and clarify the situation for local companies, hopefully increasing uptake amongst SMEs.

Other initiatives worthy of note are those involving graduate placement. These include the Shell Technology Enterprise Programme (STEP), Graduate Gateway and Student Force for Sustainability. The latter is a registered charity focused entirely on linking higher education graduates to SMEs to assist them with their environmental management work. Three programmes cover energy efficiency, waste management and rural regeneration. Some of this work comes under the PRISME (Project work in SMEs) umbrella. The work is funded through private and public sector organisations (e.g. the TECs) and involves various partners in different areas including local authorities, colleges, the Environment Agency and Business Link.

Box 3.4: PRISME - Environmental Project work in SMEs

The PRISME project is co-ordinating the short-term placement of environmental science graduates in SMEs. The project, which started as a pilot in the East Midlands with around a dozen students, is now extending across England with around 680 students, from various universities and colleges, on the books. The graduate students, who may be qualified to degree or higher degree level, have been involved in various activities and projects, carrying out waste audits, assisting with waste minimisation and pollution prevention work, helping to implement environmental management systems (ISO 14000) etc.

While young graduates may be inexperienced, they at least offer the type of cheap and dedicated resource that most small companies lack. They can, of course, be educated by company staff in the specifics of the processes and the way the company operates, while they can pass on their theoretical EMS and waste auditing knowledge to those same company staff. This at least offers the potential for the improvements to continue once the graduate has left the company.

3.5.8 Large Companies and Supply Chain Activities

As noted previously, large companies are beginning to make increasing demands on suppliers with regard to environmental management and performance. B&Q, for example, is applying pressure to encourage their main suppliers to gain ISO14001 accreditation. To some firms this is a natural extensive of quality management and the use of supplier auditing to ensure that

correct standards are being applied. The latter has been particularly common in the food sector.

Few companies, however, are providing anything other than occasional information and assistance to suppliers. Exceptions in the UK include Rover, Jaguar and Sony. Rover is perhaps leading the way by offering direct assistance to 1st and 2nd tier suppliers. In 1991 Rover established a pilot scheme to introduce EMS (BS7750 at that time) into 6 of its major suppliers. This was achieved, in part through Rover-run workshops. This pilot activity was a great success, with these suppliers making savings of between £10,000 and £100,000.

Rover have subsequently encouraged all 700 1st tier suppliers to adopt ISO 14001 or EMAS. About 2/3rds have now started the process assisted by Rover who have provided:

- on-site ISO14001 workshops;
- guidance material;
- on-site 'mentoring' with the assistance of Coventry Council Environmental Advice Services team.

The process is now moving on to the second tier suppliers, using 1st tier suppliers to assist in workshops and share their experiences.

3.5.9 Commercial Providers

There are also a large number of commercial training organisations (e.g. Aspects International, Environ, GCT Associates, AIG Consultants, Lloyds Register Quality Assurance) which are often part of environmental consulting companies. These generally provide short courses on environmental auditing, ISO 14001 etc. either in-company or at their own premises. Many of the courses are accredited by EARA, IEM or CIWEM and hence are aimed at providing a certain recognised level of attainment for those that attend.

3.5.10 Demand Trends

The providers consulted were asked to indicate the trends that they are witnessing in terms of demand for environmental courses. The main points are summarised below:

- all providers are seeing an increase in demand overall;
- the biggest demand is from medium to large companies;
- while growing, there is still only low to medium demand from SMEs;
- the main drivers are:
  - regulatory pressure, cost reduction, customer pressure, employee interest;
- the most important topic areas are:
  - regulation,
  - EMS,
  - waste minimisation,
  - environmental auditing.

It is interesting, although not surprising, to note that the courses and provisions aimed at SMEs were seeing more of a demand from SMEs than the courses with no specific target group. It is clear, from previous ECOTEC work in this area, that SME specific provisions, and other provisions best suited for SMEs including distance learning packages etc., have become more common in the last few years and are slowly beginning to make headway. It is

also important to note that accreditation through the IEM, CIWEM etc. is providing some sort of quality assurance, helping SMEs to differentiate between courses.

3.6 Summary and conclusions

3.6.1 General needs and drivers

As discussed in Section 1, SMEs make a significant contribution both to the UK economy and to environmental damage and resource consumption. Many smaller SMEs are unregulated, in terms of their emissions, although regulatory thresholds are set to try and minimise their collective impact. Those SMEs that are regulated, while meeting minimum emission limits, still tend to be wasteful of resources, despite the fact that they often operate with very tight profit margins. There remains, therefore, a strong need to reduce wastage and pollution, for the sake of the environment, to strengthen competitiveness and to secure and increase employment.

Regulation clearly remains the key driver of end-of-pipe pollution control, while cost/risk reduction, regulation and increasingly supply chain pressures are driving the uptake of EMS (e.g. ISO 14001) and waste minimisation activities. While new regulation triggers a wave of demand (and supply) for conferences, workshops etc. it is the move to ISO 14001 and increasing interest in waste minimisation that are the longer-term drivers of demand for environmental education and training. Other drivers, such as employee concerns, concern for the local community etc. are very much secondary.

3.6.2 Responsibilities, skills and competency needs

As noted in Section 3.3, environmental duties and responsibilities can cut across many roles, from purchasing, marketing and finance to production management, plant maintenance and equipment operation. Many SMEs however do not recognise this and mostly see environmental responsibilities as being purely related to regulatory compliance, pollution control and waste disposal issues. Responsibility is also seen as resting at the managerial level rather than with shop floor staff.

In the main, key environmental responsibilities rest with health and safety and or production/technical staff in medium-sized SMEs and with a technical director or MD in the smaller SMEs. Multi-tasking is the common approach with environmental roles and responsibilities being added to existing 'core' business responsibilities. The latter are largely seen as being the most important, with environmental responsibilities being secondary. Some medium sized SMEs, however, do however take a more integrated approach and in some cases employ specialist environmental or HS&E managers.

SMEs also see the key skills and competencies as being those associated with regulation, EMS and waste minimisation rather than those associated with, for example, design or purchasing. In actual fact most companies would benefit from a wide range of environmental skills and competencies including:

- Regulatory Requirements (environmental law);
- Environmental Impact Awareness;
- Monitoring Techniques;
- End-of-Pipe Abatement Technologies;
- Environmental Review/Auditing;
- Environmental Management Systems;

- Energy Efficiency Techniques and Measures;
- Waste Minimisation Techniques and Measures;
- Statistical Analysis Techniques;
- Design for the Environment;
- Process Optimisation/Clean Technology;
- Green Purchasing (products and materials);
- Environmental Investment Appraisal.

Environmental skills and competencies tend to be 'grafted-on', i.e. staff are recruited as they always were for their core skills and then trained in the additional environmental areas.

3.6.3 SME activities and preferences

As discussed in Section 3, Environmental training and education is mostly conducted in a reactive and ad hoc way in UK SMEs, with very few using any form of TNA or making specific provisions in terms of budgets or staff development plans. Few make use of the services provided by the TECs, Business Link and other support organisation.

While most SMEs do not see qualifications as being important per se, some medium-sized SMEs are employing environmental managers with environmental degrees etc. This is seen as an easy fix; the whole solution rather than part of an overall company-wide approach.

The training itself is still dominated by self-help, on-the-job and informal internal training, topped up by external seminars and short courses. In the main companies are accessing training relating to:

- environmental regulation;
- environmental management;
- waste minimisation.

The consensus is that training provisions need to be low cost, very concise, modular/flexible, sector specific and easily accessible (e.g. distance learning, on-site courses, local workshops). Increasingly it seems that companies are looking for courses that have some form of accreditation, for example from the IEM or CIWEM. Key providers include:

- trade organisations and professional bodies;
- Government departments, agencies and programmes (e.g. the ETBPP);
- not-for-profit organisations (e.g. Groundwork);
- universities and other higher education establishments.

3.6.4 The Environment Agency

As noted in Section 3.4 the Environment Agency employs hundreds of staff covering most environmental disciplines including pollution prevention and control, waste minimisation, flood defence, fisheries, conservation etc. Responsibilities are well defined. The Agency is aspiring to a situation whereby training is needs driven, competency requirements being set out in accordance with roles and responsibilities and the corporate plan. Much of the training is done in-house through the National Training Service although some external organisations are used.

3.6.5 Support and Provisions

The discussion in Section 3.5 demonstrates that there is no shortage of environmental courses, seminars, workshops etc. being provided by higher education establishments and various trade/industry, public sector, not-for-profit and commercial organisations. In many cases Business Link, the Environment Agency and/or other organisations (e.g. Groundwork, BiE) are involved in the training itself or in partnerships to help deliver it.

Increasingly providers are meeting the specific demands and needs of industrial SMEs. More and more distance learning courses and flexible in-company packages are becoming available, many from universities and not-for-profit organisations (e.g. Groundwork, SBEN), while in some cases products are being customised to suit a particular sector or sub-sector. Increasingly course providers are gaining accreditation from professional bodies such as the IEM and CIWEM.

Occupational Standards and NVQs are also playing a part with a handful that are specifically 'environmental' and many more that are related to correct process operation and hence to waste minimisation. Sector and occupation-specific NTOs are helping to develop the appropriate standards.

Trade and industry bodies are often in a position to provide the most relevant information as they have the best understanding of the detailed requirements of their members. Sector organisations such as the Food Research Association and the BPIF (printing) are examples of active trade bodies. The ETBPP is also of great importance, offering free sectoral and cross-sectoral guidance as appropriate. Large companies are also starting to take a role through offering assistance with EMS etc. Increasingly private sector provisions, in particular commercially run conferences and consultancy support, are seen as being costly and often inappropriate.

Mechanisms and initiatives are in place to raise awareness and promote training provisions and benefits. While almost every conceivable type of provision is represented there is great variation across the country and numerous regional initiatives in addition to those operating nationally. Business Link, the Environment Agency, TECs, local authorities, Chambers of Commerce and the not-for-profit organisations are increasingly working together to try and provide a co-ordinated approach that better reaches small companies. Regional strategies, networks and co-ordination bodies are being established in some areas to achieve this.

3.6.6 Barriers

While considerable efforts have been made to make courses and other material more suitable and accessible, and to promote training and its benefits, numerous barriers still persist. As noted by the Food Research Association "it is still difficult getting across to SMEs who see 'environment' as a cost rather than a benefit". Demand for environmental education and training is still lowest from small and micro SMEs. Companies themselves perceive the main barriers as being:

- resources constraints, human and financial;
- accessibility, lack of local or on-site provisions;
- suitability, material often being too general or designed for larger companies.

These barriers are certainly real enough. For many hard-pressed managers even reading the literature about courses and publications can be too time consuming. In fact many companies

receive literally dozens of leaflets and telephone calls concerning environmental seminars, workshops, training courses, publications and tools, from both the private and public sectors every month. This can become overwhelming and counter-productive as 'initiative fatigue' sets in.

In terms of costs, £300 for a day-long seminar cannot often be justified in terms of the immediate and obvious benefits that will result. Suitability is also a problem. Many SMEs have been sold training products, perhaps in the form of seminars, that have not been appropriate and hence have had a negative effect on their view of such provisions. Support services can have the same effect. Some organisation in the UK are now offering superficial environmental reviews which are of limited benefit and hence can also be counter productive.

There is also another important issue concerning the gap between what SMEs believe they know and what they actually know. Many SMEs, for example, feel that they understand their own training needs and that they have various skills and competencies in relation to environmental management and waste minimisation. Survey work however, both by ourselves and other organisations, indicates that there are many other barriers including:

- lack of awareness of the real benefits and cost-saving opportunities;
- poor awareness of skill/competency needs to capitalise on opportunities;
- poor awareness of provisions/support options to meet these needs.

Obviously without being aware of the benefits, companies are unlikely to look for environmental training to allow them to achieve solutions. Even where companies are aware of the benefits few assess their needs in any systematic way by using TNA, by establishing proper staff development plans, setting aside adequate budgets etc. Things are mostly done on an ad hoc basis and hence are not as effective as they could be.

There are also two key external factors which influence awareness of benefits, needs and provisions:

- the extent to which support networks are in place and properly co-ordinated;
- the extent to which support networks are active in reaching SMEs.

In terms of the first, companies tend to be bombarded with information and offers of courses and other assistance. In many cases SMEs, in particular small and micro SMEs, do not have the time to absorb this information and in any case are not in a position to judge the quality and relevance of what is on offer. Hence the picture is often a complex and confusing one for many SMEs, often turning them off environmental improvement other than that required for compliance. Efforts to accredit courses and to co-ordinate regional support should help to address these problems.

In terms of the second point, support is often passive in that it asks companies to identify their own needs and then informs them of suitable provisions or provides self-help material. Even where considerable efforts have been made to raise awareness of benefits and needs, the result has often been disappointing. The need here is for more active 'hands-on' support of companies through workshops, subsidised consultancy, graduate placement etc.

3.7 The way ahead - recommendations

Most of the findings here were also true in the early 90's as previous ECOTEC work shows, although the situation is improving. More and more SMEs are being reached by various initiatives and programmes (e.g. the ETBPP, Groundwork, BEA etc.), and these SMEs are gradually improving their practices. The pace of change is slow however.

Many SMEs remain unaware of the regulatory 'stick' and/or the waste minimisation 'carrot', as they apply to their business, and are confused by the wide range of support organisations, initiatives and provisions. In fact it appears that excessive and uncoordinated activity has often been counter-productive through its 'initiative fatigue' effect. In addition the passive help provided has often not been enough to kick start improvement programmes.

The way ahead, therefore, has to involve better co-ordinated, better directed and more active support and provisions. With regard to the UK, therefore, we would suggest that there is a need to encourage and/or support:

- more active promotion of environmentally-related cost benefits. In an ideal situation this would involve the use of environmental sector specialists to clearly identify actual opportunities for improvements and cost savings through detailed environmental reviews. Company case studies, as produced by the ETBPP, should also continue to be promoted. Without this promotion companies do not tend to see the benefit of, and hence need for, environmental training;
- the greater use of environmental training needs assessment (TNA), in particular focused on competitiveness issues including waste minimisation and energy efficiency. These assessment should also preferably be performed by environmental specialists who understand the issues;
- the continuing development of environmental NVQs and the integration of environmental management ideas into other NVQs (e.g. those relating to manufacturing processes). The NTOs, including METO, are helping to improve the situation in this regard;
- the continuing integration of environmental, health and safety and quality management methods and systems. Waste minimisation and energy efficiency, for example, should be promoted as an integral part of good business practice and TQM;
- SME-appropriate provisions. Courses and materials should all be carefully-designed to specifically suit SMEs, by being very practical, concise, modular/flexible and cheap, or at least extremely good value for money. They should be delivered where possible on-site (where appropriate using IT aids and distance learning) or at least locally, for example through workshops. Encouragingly many organisations, including several Universities, sector bodies and not-for-profit organisations (e.g. Groundwork) are now providing such SME-appropriate provisions. The University for Industry (UfI) initiative should also greatly assist this process.
- sector-specific and quality-assured provisions. Trade and professional bodies should be encouraged to provide and accredit courses and other training materials to ensure this. Conversely providers should be encouraged to develop materials in conjunction with trade and professional bodies (as the ETBPP does). Groundwork is setting an example in this regard on the not-for-profit side through its work with CIWEM and IEM;
- direct engagement and interactive training/support activities. Hands-on workshops are often more effective than passive seminars while graduate placement schemes, subsidised consultancy support, waste minimisation clubs etc. can provide the resource and the

hand-holding that companies really need to kick start in-house improvement programmes;

- supply-chain initiatives - the activities of larger companies in encouraging and supporting their supply chains, for example in terms of EMS development and accreditation. Rover and Jaguar offer a good example of this in the automotive sector.
- the simplification and improved co-ordination of support and training provisions so as to reduce confusion and initiative fatigue. Making specialist (and quality-controlled) environmental advice a Mandatory Service Requirement for Business Link, or to provide additional funding to Business Link in this area, would be a good starting point in this regard[3]. The development of an environmental support strategy, network and co-ordinating body for each region, making use of public-sector funding and involving all relevant bodies, would also be of enormous benefit. Use of common 'brand' names for such networks/bodies would help to clarify the situation.

In South Wales a network of Business Environment Co-ordinators (probably to be provided through Groundwork) is to be established to complement Business Connect where the latter has no environmental expertise. The BECs will act as conduits between local businesses and the providers of support and information, reporting to a sub-regional strategic forum involving all of the key providers and stakeholders. In the West Midlands a regional strategy and network is currently being developed through a co-ordinating body, while similar co-ordination activities are taking place in a handful of other regions (e.g. Lancashire).

Finally, so as to ensure that the UK obtains all that it can in sustainable development terms from environmental education, training and support, it is also important to identify best practice and replicate/disseminate this nationally. Certain regions within the UK, other countries (including the Netherlands), and industrial sectors (within the UK and elsewhere) offer models that can be used to improve the overall effectiveness of environmental education, training and support. Such 'good practice' models should be investigated further to allow this.

[3] The recently announced Government Small Business Service (SBS) is intending to improve the quality and coherence of support including that through the Business Link programme.

4. Netherlands report

4.1 SMEs in their national social, economic and environmental context

4.1.1 The economic and social importance of SMEs

Background

SMEs are vital to the health of the Dutch economy, as they are to wider EU economy. SMEs in the Netherlands representing over 90% of manufacturing companies and in some sectors far more than this. In the graphics/printing sector SMEs account for 97% of around 3,600 companies and 61% (2196) have less than 10 employees. Overall SMEs in Holland also account for around 52% (EU-15 average 50%) of all industrial employment, 7% more than in the UK. The most environmentally significant and SME dominated manufacturing sectors include:

- Metal Products/Finishing
- Printing and Publishing
- Food and Drink
- General Engineering
- Speciality Chemicals (including dyes, paints and inks)
- Rubber and Plastics Processing
- Furniture

As in the UK many larger companies and groups are made up of several sites/divisions. In some cases these sites/divisions act on a semi-autonomous basis with little guidance or support from their sister or parent company/ies. These sites can be thought of as pseudo-SMEs.

In terms of type of employee, as in the UK, SMEs largely employ skilled and semi-skilled workers to operate machinery of one sort or another and additional clerical and managerial staff. Larger firms tend to employ more managerial staff who can afford to be more specialised than those in the small and micro SME where managers have to undertake all manner of tasks (multi-tasking).

Location

In terms of location, the vast majority of SMEs are based in or close to urban areas and centres of population i.e. in the provinces of Noord-Holland, Zuid-Holland and Utrecht, an area including the cities of Amsterdam, Rotterdam, The Hague and Utrecht which together make up the "Randstad" conurbation. The ports of Amsterdam and Rotterdam are the main industrial centres for the heavier industries such as chemicals, petrochemicals, iron and steel while The Hague and Utrecht are important administrative centres. The study area of Overijssel is somewhat remote from these main areas of population but does include the industrial centres of Enschede and Zwoile.

Turnover and Profitability

SME turnovers vary enormously, both from sector to sector and within sectors. On average turnovers are below £1m. As in the UK most SMEs in the manufacturing sector achieve less than 5% profit margin, significantly less than profits in the service sector.

Relationships With Larger Companies

In terms of the relationship with larger companies, Dutch SMEs, like their UK counterparts, act both as subcontractors and, more commonly, as equipment and component suppliers. Many companies have to tender on a competitive basis for continuing work. The large companies (e.g. Philips, Shell) are in an extremely powerful position in that they dominate certain sectors of the market and can be the sole customer of the SME.

Increasingly large companies in the retail, electronics, telecommunications, oil gas and chemicals sectors are applying pressure downwards to improve both the quality management and environmental management of their main suppliers. The 1997 KPMG survey of 84 Environmental Reports from large Dutch companies showed that 29% made reference to environmental requirements for suppliers.

4.1.2 Affiliations - The role of trade associations, unions etc.

Dutch society is certainly more consensus-led than the UK and hence there is a greater tradition of involving stakeholders including trade unions, trade associations and the broader community.

Links with trade associations etc. tend to be stronger, more uniform and better organised than in the UK. Indeed some of the trade associations got together to form a National Environment Centre (NMC), specifically to provide environmental support for industrial SMEs through training courses, projects and a 'helpdesk'. Unfortunately the NMC has recently ceased to exist although some of its duties have been subsumed by the national co-ordinating body for the regional Company Environmental Agencies (BMDs - see below). It is also important to note the crucial role that trade associations have played in the establishment of voluntary agreements.

Trade union interest in environmental and training and education matters has historically been more important than in the UK, reflecting the greater involvement of 'social partners' in company matters. Trade unions (e.g. the CNV and the FNV) have actually been involved in various projects, in particular to raise environmental awareness and to provide training, for example through study days. This is very different to the UK where trade unions play a very minor role.

4.1.3 Environmental issues and control

Issues

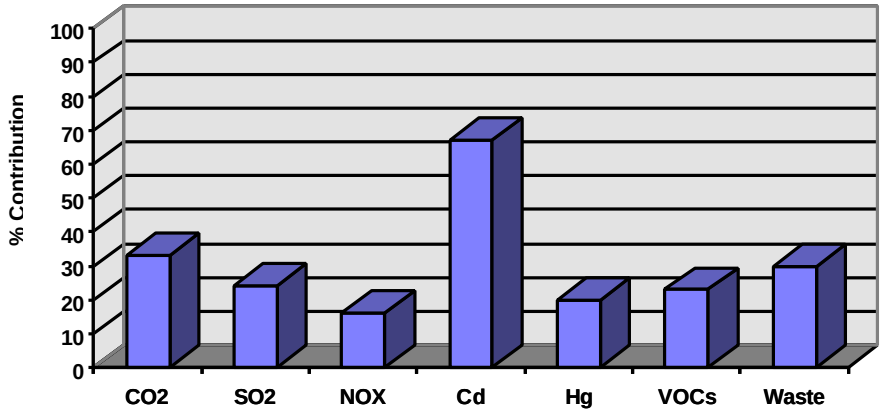
The environment is a national priority in the Netherlands, with a high level of awareness of water, soil and air pollution issues. This reflects the relative sensitivity of the country's environment (about 25% of the land area lies below sea level), the high population density and the fact that groundwater sources provide 70% of the drinking water supply. Surface waters are in some cases polluted by emissions from local industry and transboundary pollution from industry further upstream on the Rhine and Meuse. The excessive use of groundwater has in some places resulted in 'dehydration', requiring major reductions in water extraction to rectify these problems. Land contamination is closely linked to groundwater quality and there are estimated to be 110,000 contaminated land sites resulting particularly from petrochemical spills, phosphates, nitrates and landfills.

In the face of these issues, the 1983 Dutch Constitution set the requirement that Government must provide a land fit for habitation and have regard to the protection and improvement of the

environment. This concern is encapsulated in the Dutch National Environmental Policy Plans (NEPPs) which have become the cornerstones of national policy and legislation since 1989 when the first Plan (NEPP 1) was drawn up, aimed at achieving sustainable development. The third plan, NEPP 3, is currently in place covering the key themes of greenhouse and acid gas emissions; eutrophication of watercourses; release of toxic and hazardous pollutants (to air, water and land); waste disposal; "disturbance" (noise, odour etc.); groundwater depletion; and "squandering" (resource depletion).

Figure 4.1 below shows the importance of industry in the overall picture, although there is no known data available for SMEs alone. It seems likely that SMEs in the Netherlands play just as large a part as do SMEs in the UK and possibly more so due to the self-regulatory nature of environmental control (see below).

Figure 4.1: *Industry Contribution to the Pollution Load*



SME Environmental Problems

The environmental problems faced by Dutch SMEs are broadly the same as those faced by UK SMEs, relating to effluent, emissions to air, chemical storage, material wastage, waste disposal etc. The reader is referred to the discussion in the equivalent section in Part B of the report.

Legislation and Voluntary Agreements

The key pieces of recent environmental legislation include the *Water Management Act* (1989), the *Environmental Protection Act* (1992) (harmonising legislation applying to all environmental media), *the Waste Act* (1993), the *Hazardous Waste Decree*, the *Soil Protection Act* and the *Noise Pollution Act*. Air quality standards that underpin the Environmental Protection Act are contained in the Netherlands' Emission Guidelines (Nederlandse Emissie Richtlijen, NER) and are based upon the TA-Lüft regulations. As regards the EU Urban Wastewater Directive, the Netherlands intends to implement the stringent "sensitive area" treatment requirements (for substances including phosphates and nitrates) over all its territory.

A plan called KWS (Hydrocarbon) 2000 aims to reduce VOCs by 50% by 2000 compared to 1991 levels. These changes are being implemented through voluntary agreements (covenants) with industry. Waste is also the subject of various covenants between the Government and industry, such as the Packaging Covenant and the Synthetic Waste Covenant and that governing the Graphics/Printing Sector (see Box 4.1).

These Voluntary Agreements (VAs), of which there are over 100, are fundamental to Holland's partly self-regulated approach to environmental protection, one that is far removed from the highly regulated approach taken in the UK and other Member States. While less demanding than such 'Command and Control' approaches VAs do not provide a level playing field and hence allow free-riding, a particular tendency amongst SMEs. Examples of VAs are given in Boxes 4.1 and 4.2 below.

Box 4.1: Graph*ics Industry Voluntary Agreement*

In 1990 the graphics industry (KVGO/Kartoflex) and the government (VROM, provincial and local authorities) signed a 'declaration of intent', in which the sector defined important environmental objectives for the year 2000. In April 1993 the government and the graphic industry signed the agreement, in which concrete measures were defined to meet the environmental objectives formulated, including air pollution, water pollution, disposal of chemicals and other waste, soil contamination, e.g.:

- 75% reduction in hydrocarbons;
- 50% reduction in heavy metals;
- 10% reduction in waste;

To assist the graphics companies, the branch associations of KVGO organised information meetings and set up an 'implementation programme' with specific technical information and 'good housekeeping' hints to implement the necessary measures. Because of the uniformity of the sector, the implementation programme could be made very concrete.

When evaluated in 1995, the programme was behind schedule although there had been good improvement. For example, 60% of photoprocessing companies with a high use of fixer had bought an installation to recover silver. 40% of the members of KVGO and Kartoflex had developed an environmental management system.

Enforcement

Enforcement responsibilities are split between the three levels of government: national, provincial and municipal.

- Primary responsibility for enforcement lies with the Ministry for Housing, Planning and Environment (VROM), assisted by the Directorate-General for the Environment.
- Powers are also given to the Environmental Support Unit which provides expert assistance to the police and Offices of Public Prosecutors in investigating environmental offences.
- The 12 Provincial Executives play the main licensing and enforcement role in respect of activities involving waste, soil pollution and certain industrial facilities.
- The 28 Water Boards enforce water quality controls pursuant to the Water Quality Act using powers delegated to them by the Provincial Executives.
- The Environmental Inspectorate, a decentralised Government inspectorate, operates in each province to supervise compliance by companies, individuals and local authorities.

The Mayors and Aldermen of the 640 municipalities enforce the regulations covering waste disposal facilities.

Box 4.2: *The Packaging Voluntary Agreement*

The Packaging Agreement, signed by the Government and the Dutch packaging industry - SVM (The Packaging and Environment Foundation) - on 6 June 1991, applies to all packaging put on the Dutch market, and covers the whole packaging chain (including SME manufacturers but excluding small retailers) for a period of 10 years. The overall objective of the Agreement is to end the landfill of packaging waste by the year 2000. A new Packaging Ordinance came into force in 1997 and an associated VA was put in place the same year.

SVM is essentially a co-ordinating organisation. Under the 1991 Agreement it represented 275 companies including raw material suppliers, converters, packer/fillers, distributors/retailers and recyclers. Together these companies represented 60% of the total Dutch trade and industry turnover. The Agreement is wide ranging in that it requires a wide variety of waste prevention, reuse and recycling measures (e.g. reduced weight, reduced use of PVC, lead etc., improved recyclability, labeling etc.)

Member companies have to fulfill their obligations either through contracting with private waste management companies or through co-operation with local authorities, for which they have to pay a fee. It is interesting to note that while few SMEs are members of SVM, and hence fall outside the agreement, most companies are already obliged under the Provincial PMV regulations to segregate and arrange for the recycling of their own wastes. The Netherlands had almost achieved its interim objective of a 50% overall recovery rate by 31st December 1995.

Overall enforcement is reasonably strict, although perhaps less consistent than in the UK due to the many regulatory bodies involved. In theory all industrial companies now require one integrated permit covering all media. Such permits can include conditions relating to waste minimisation etc. Certain more homogenous sectors (e.g. vehicle respraying) are covered by general regulations rather than site specific permits. Permit control staff from the Environmental Inspectorate, like their equivalents in the UK Environment Agency, are trained to provide advice on waste prevention and EMS implementation.

Environmental Reporting and Management

In the face of the high level of concern over environmental matters in the Netherlands, companies have also taken a proactive stance, environmental management being well established amongst Dutch companies. From 1999 it will be mandatory for 330 large Dutch industrial companies to produce a yearly environmental report, these companies coming from the chemicals, plastics, textiles, waste management and metal processing sectors. Supply chain pressures are spreading responsible environmental attitudes down from large companies to SMEs.

The Netherlands has also been particularly active with regard to accredited and sector-specific environmental management systems (EMSs). A 1996 KPMG study in the Netherlands found that 29% of smaller companies (less than 100 employees) were well advanced with EMS implementation, either with a national/sectoral standard (based on BS7750) or EMAS/ISO14001. While a high figure relative to the UK, this compared with figures of 61% for medium sized companies (100 to 500 employees) and an impressive 86% for larger companies. In terms of the sectors for this study, 65% of chemical companies, 52% of food companies and 34% of other companies (including printing) were well advanced with the implementation of an EMS.

One reason for this high level of uptake is the development of sector-specific EMSs by trade associations. KVGO (printing), for example, developed an EMS along with implementation material and an environmental co-ordinators course for companies with over 100 staff. KVGO

then went on to develop a Total Quality Management System with environmental management embedded in it; a step beyond anything that has happened in the UK.

Waste Minimisation and Clean Technology

The concepts of waste minimisation and clean technology are also well established in the Netherlands. Of most significance are the Clean Production Programmes, 1 and 2. The first of these ran from 1992 to 1995 and is described below in Box 4.3. The programme was very successful, with over 9,000 SMEs being given advice, 4,500 through regional meetings, 3,000 through activities undertaken in the various industry sectors and 1,800 through obtaining individual advice. The results indicate that the programme reached a very broad spectrum of SMEs. The practical experiences and results gained by participating SMEs demonstrate the possibilities of combining good environmental management with good (economic) business practice.

Box 4.3: *Cleaner Production Programme 1*

Introduction
The Cleaner Production Programme was undertaken from July 1992 until October 1995 by the Netherlands Network of Innovation Centres, the eighteen regional Innovation Centres (Senter), the National Environmental Centre (NMC), and the twenty regional Company Environmental Agencies (BMDs). The programme was commissioned and funded by the Ministry of Economy (EZ) and the Ministry of Housing, Spatial Planning and Environment (VROM). Every year a budget of Df1 1,300,000 was available (I million for knowledge transfer, 300,000 for project co-ordination).

Objectives
The main objective of the Cleaner Production Programme was to stimulate the use of environmental (clean) technology in SMEs by providing information specific to the different priority sectors of industry, by providing information at regional level and by giving advice to individual businesses. The second objective was to harmonise the information and advice given to enterprises by intermediary organisations.

Activities
A communications model was set up on four separate levels for the purpose of reaching these target groups as effectively and efficiently as possible: national communication, regional information, stimulation of environmental activities with trade/industrial sector associations, and advice to individual enterprises.

Instruments at national level:
- The television course 'Cleaner Production' of the Teleac foundation, including a helpdesk for participants;
- articles published in several professional magazines;
- promotion of the VA-Mil regulation (a fiscal scheme to stimulate environmental investments).

The Innovation Centres Network and the National Environmental Centre took the lead in these activities. All information activities were focused on raising awareness among entrepreneurs in SMEs and increasing familiarity with the Cleaner Production Programme.

Instruments at regional level:
- meetings for managers in the industry;
- training courses about prevention of wastes and emissions.

The Innovation Centres took the lead with regard to the regional information activities. All ICs organised informative meetings on environmental topics for the entrepreneurs in their own district. The courses in waste and emission prevention were organised in conjunction with the NMC and the BMDs.

Activities with trade and sector associations:
- The IMPRES project, a project in which 9 groups of enterprises from various branches participated;
- discussion platforms for environmental managers;
- a study course of the Association for Surface Techniques and Surface Materials (VOM);
- collection and distribution of sector-specific information on the prevention of waste emissions (manuals and factsheets)

The NMC took the lead in planning and stimulating activities together with the trade and sector association. The idea behind this approach was to stimulate and support the introduction of cleaner production among the members by means of giving them branch specific information and by setting up branch projects. The ICs BMDs and electricity companies were often called in to help.

Individual advice:
- first and second line consultancy.

Individual advice usually has the greatest effect, but normally the cost for consultants is too high for SMEs. Within the Cleaner Production Programme the cost of an environmental review (undertaken by the BMDs and the ICs) was covered.

The success of the programme has led to a follow-on programme, CPP 2. This started in 1997 and will run for three years to 2000. CPP 1 and 2 have involved many of the SME environmental support organisations, these being noted below in Box 4.4.

Box 4.4: *SME environmental support organisations*

The Innovation Centres (Senter)

There are eighteen regional Innovation Centres (Senter) in the Netherlands, co-ordinated by central office. These regional centres give all-round advice to SMEs in various industrial sectors. The Senter are geared mainly towards environmental technology, innovation and energy. The Senter first give a free consultation and then try to refer clients to specialists for further help.

The Regional Company Environmental Agencies (BMDs)

Work carried out by the BMDs focuses in legislation and regulations (permits) and on environmental management. BMDs also work regionally, but enterprises have to pay a membership fee to get advice. Like the ICs, BMDs have SMEs as their target group. Originally there were 25 BMDs but during the last two years a number of BMDs have merged.

The National Environmental Centre (NMC)

The NMC was founded by a number of Dutch sector associates to initiate and co-ordinate activities concerning environmental care in SMEs (e.g. courses, branch projects, a helpdesk). The NMC no longer exists, some of its functions being subsumed by the national body for the BMDs.

The success of CPP 1 are largely attributed to the streamlining of all relevant actions relating to SMEs and to the co-operation and collaboration between the intermediary organisations: the National Environmental Centre, the Innovation Centres, the BMDs and other regional organisations. The networks that were set up will continue to contribute towards improved regional co-ordination of cleaner production and waste minimisation activities in the future.

SME Attitudes, Awareness and Motivation

In terms of SME attitudes, a 1997 VROM survey examined SME attitudes to environmental improvement and came up with the findings shown in Box 4.5. The results indicate that SME attitudes to environmental management in the Netherlands are significantly better than those of UK SMEs, with a significant percentage actually doing something or seeing it as an integral part of business management.

Box 4.5: *Results of 1997 VROM Attitudes Survey of SMEs*

- 22% not concerned
- 41% concerned
- 22% doing something
- 15% see it as part of good business practice

These more positive attitudes perhaps result from the well co-ordinated, sectoral and regional approach to waste minimisation and 'clean technology' adoption, as exemplified by the work of the Cleaner Production Programme and sector organisations such as the KVGO. That said, not all SMEs are enthusiastic about environmental improvement. The FNV (trade union) noted that when running study days on environmental management in 1994, attendance was poor relative to some of the courses that it runs.

While there appears to be little data concerning the environmental awareness of SMEs in the Netherlands, our consultation work suggests that awareness, both in general terms and in terms of the relevance to manufacturing, is significantly better than in the UK. Again this is almost certainly due to the efforts of the trade associations, the BMDs and the CPP.

In terms of motivation, our consultation work in the Netherlands suggests that there are few differences between the UK and the Netherlands in that the main environmental motivators for companies are:

- cost savings (e.g. through waste minimisation etc.);
- regulatory pressure (the need to be compliant);
- customer pressures/company image (i.e. customer perception).

Regulatory pressure is less of a driver for Dutch SMEs than their UK counterparts, however, due to the partly self-regulatory nature of the Dutch system. While it is clear that supply chain pressures (from large companies down to smaller suppliers) are becoming increasingly important in the Netherlands as in the UK, few SMEs in the Netherlands currently appear to be under any real pressure to adopt an EMS, although they do regularly seek advice from their customers.

Environmental Performance

In terms of the environmental performance of SMEs per se, there is little data available since analysis tends to be done by sector or environmental media. As noted already, and confirmed by the company case studies conducted, many of the smallest SMEs do not take an active part in the voluntary agreements. Hence, while they have to meet minimum standards (discharge consents etc.), they have little incentive to improve in many areas and hence have relatively poor environmental performance. Environmental performance amongst larger SMEs is significantly better however.

The increasing numbers of companies implementing some form of EMS, is however, encouraging. The KPMG work for VROM indicated that even amongst small SMEs, the proportion of companies advanced in the implementation of an EMS had increased from 8% in 1991 to 29% in 1996 and that only 7% were not considering an EMS at all. This appears to suggest that the Netherlands is some years ahead of the UK in this regard.

Barriers and Success Factors

The main barriers to waste minimisation, and more broadly environmental improvement, are in general the same for Dutch SMEs as UK SMEs, although their relative importance will vary in accordance with the efforts being made in the two countries to address them. As noted already in Part B, the main barriers are:

- lack of time/staff resources;
- lack of financial resources;
- lack of investment appraisal capability;
- lack of understanding of environmental problems and risks;
- the lack of understanding of the potential benefits of waste minimisation;
- economic short termism (payback has to be less than 2 years);
- lack of technical expertise/confidence;
- the view of environmental activity as peripheral to the core business;

- initiative fatigue/overload;
- mistrust of other companies in networks/groups .

4.1.4 Summary And Conclusions

Dutch SMEs are extremely important to the Dutch economy. Unlike their UK counterparts, they do seem to be more involved in the general 'social dialogue', through their trade unions, chambers of commerce etc.

Dutch SMEs seem to be somewhat more advanced than many in the UK, when it comes to environmental awareness and performance, the evidence for this being in the proportion of smaller SMEs implementing or considering an EMS. Overall, it seems to be the greater direct involvement of the trade associations (e.g. through voluntary agreements, sector specific EMS etc.) and the better overall co-ordination of programmes (CPP) and support, through the regional BMDs and Senter (innovation centres), that makes the difference here.

That is not to say, however, that all Dutch SME's are positive in their attitudes to environmental improvement. Many Dutch SMEs still see environmental improvement as a threat to profitability rather than as an opportunity. Many smaller SMEs also undoubtedly see voluntary agreements as a useful mechanism to avoid certain elements of regulation, to act as so-called 'free-riders'.

4.2 The education and training system in the Netherlands

4.2.1 Academic Provisions

All large towns and cities have a University, although numbers are fewer than in the UK. In 1997 there were almost 169,000 university students, attending the following institutions:

- University of Amsterdam (UvA)
- University of Groningen (RUG)
- University of Leiden (RUL)
- University of Maastricht (UM)
- Erasmus University, Rotterdam (EUR)
- University of Utrecht (UU)
- Wageningen Agricultural University (specialises in agriculture and the natural environment)
- Delft University of Technology (TUD)
- Eindhoven University of Technology (TUE)
- University of Twente (UT Enschede)
- Free University of Amsterdam (VU: its name refers to its Protestant origins)
- University of Tilburg (KUB Tilburg)
- University of Nijmegen (KUN)

The University Government (Modernisation) Act (MUB) came into force on 1 September 1997 and strengthens the position of the university authorities, giving them greater autonomy.
Given the compact nature of the country, all universities are reasonably accessible and almost all offer some form of environmental course. One of the most important universities in terms of environmental education is the University of Twente which contains the Centre for Clean Technology and Environmental policy (CSTM), a research institute.

Other smaller towns also have at least one Higher Education Institute (HEI) in the form of a college or highschool (Hogeschool). Some of these also offer environmental degree courses as well as vocational qualifications in the form of MBOs and HBOs (see below).

The Open University, based in Heerlen, is a state establishment offering open distance learning courses at university degree level for people aged 18 and over. It offers courses in law, social sciences, arts subjects, economics, management and administrative science, engineering sciences and natural sciences. Courses are taught as separate modules, so that students can combine modules from various courses to compile their own programmes of study. The Open University no longer provides HBO vocational courses due to lack of demand in recent years.

As in the UK, Open University courses are taught through the use of TV programmes, video and audio cassettes, residential schools etc. There are also study centres spread throughout the Netherlands, providing information, guidance and advice for students in relation to their studies. The Open University also plays a role in introducing innovations in higher education. It works as part of various university and HBO college consortia to develop joint teaching materials, new methods of teaching and educational expertise.

4.2.2 Vocational Education and Training

The Netherlands has a strong history of vocational education and training running in parallel with the more traditional academic side. From the age of 16, students can take an Initial Vocational Training (IVT) route or take up an apprenticeship, the latter involving typically 80% practical work and 20% academic study. Older students follow Continuing Vocational Training (CVT) programmes including part- time senior vocational education (MBO), part-time higher vocational education (HBO), Open University and entrepreneurial education and training.

In the early 90's, Sectoral Consultation Committees for Education and Business (BOOB's), involving social partners (unions, employer associations etc.), were set up to compile the occupational qualification profiles for senior vocational education and to assist with curriculum development. Partly as a result of this work, a new vocational education system, the 'Short term vocational education programme' (KMBO), has been operational since August 1997. This new programme is considered to be innovative, as its curriculum is completely modularised, with each module constituting a set of skills and tasks that are traceable in occupational practice.

In order to improve efficiency of education and training provision, the Government also recently established multi- sectoral 'Regional Training Centres' (ROCs) to replace older institutions covering just one area of vocational training and to merge public institutions providing CVT with those providing different types of adult education. The mergers were concluded in 1997 and pull together vocational education, apprenticeship tracks, and both adult basic and general education. There are now 61 regional training centres (ROCs) had been founded, replacing over 500 vocational schools and 300 adult education organisations. In addition to the government funded programmes that they provide (MBOs, HBOs etc.), they are allowed to operate in the market by providing training to third parties including SMEs. In 1997 there were about 259,000 students on HBO courses.

Experiments are currently going on, within the HBO framework, with various forms of dual training, combining learning and working. Another current priority, of both government and industry, is to attract more students onto technical courses. In recent years there has been a marked increase in the number of students with MBO diplomas enrolling on HBO courses and around a third of all those completing MBO now take this route. For this reason, the alignment of MBO and HBO will be improved over the next few years.

Parallel to the above developments, national qualification structures have been in place since August 1997. The development of the national qualification structure is the responsibility of the new National Organisations for Vocational Education and Training, established in 1993, which encompass the former National Organisations for Apprenticeship Schemes and the former Sectoral Consultation Committees. These are similar to the UK National Training Organisations (NTOs). The National Organisations are co-ordinated through a national body, C.O.L.O.

There are currently 22 National Organisations covering all the occupational areas, the primary functions being the development of the qualification structures in close co-operation with the social partners (e.g. unions). These qualifications (MBOs/HBOs) are broadly equivalent to NVQs in the UK and also have five levels:

- assistant;
- basic vocational;
- professional;
- middle management;
- specialist.

The National Organisations also provide general quality assurance of vocational training by maintaining the qualification structures. Lastly, they monitor the developments in their sectors.

The ROCs, in the form of local colleges etc., are responsible for determining how to teach the qualification structures devised, as well as Examination and Certification. Quality is maintained through an inspectorate.

Despite the absence of a legal framework for training in companies, agreements centred around training provision have been made at a sectoral or company level, and are supported by the Government. For example, in almost half of the collective labour agreements (either at company or sectoral level) training clauses are included which either concern training in general, the establishment of sectoral funds or the right to some training leave. The collective agreements not only specify the number of days allocated for educational leave, but lay down the percentage of the gross wage bill that employers have to contribute to. The Government has no role in respect to the usage and operation of the funds.

In terms of Government funding, 25 % -100% of training costs are subsidised while there are other funded arrangements for particular areas;

- Contribution Scheme for Apprenticeships (BVL):
- Contribution scheme for Sectoral Training (BBS):
- Compensation Scheme for the Training of Unemployed (BBSW).

It should be noted that not all CVT is publicly provided or funded, business, industry and other private sector providers taking some responsibility, particularly for the training of the unemployed. Many private sector courses, however, are not bound by an accreditation framework and do not lead to national diplomas or certificates. In fact private sector training providers do not even have to meet eligibility criteria.

Although investment in vocational training has steadily risen over the last decade, there is disproportionate cover of larger enterprises. SMEs are still failing to get involved in training agreements and other programmes. In terms of the future, the Dutch Government has a national action plan for Lifelong Learning, in which new initiatives are to be included to stimulate enterprises and individuals to invest in training.

4.3 SME environmental education and training needs

4.3.1 Introduction

Environmental protection has been high up the agenda in The Netherlands for far longer than in the UK, and as a result Dutch SMEs are to an extent more advanced. The development of voluntary agreements and other regulation has certainly had an impact on roles, responsibilities and skill/competency requirements and hence the need for environmental education and training. Smaller SMEs have been less affected, however, than medium-sized SMEs and larger companies.

New skill/competency requirements have been approached on a national/regional basis through the co-ordinated work of the National Organisations/ROCs, the trade associations and unions, the BMDs and the Senter. This has led to a clearer route to environmental training and support for SMEs in the Netherlands and greater awareness of provisions and the benefits they can bring.

It should be noted that the discussions that follow are largely drawn from the company case study material of Annex 2, supported where appropriate by additional observations based on ECOTEC experience and the available literature.

4.3.2 Environmental Duties, Responsibilities and Roles

As in the UK, the study work has identified that most of the consultees believe that environmentally-related pressures have resulted in new roles and multi-tasking for existing employees. For example, at least one person on most manufacturing sites has to take responsibility for some or all of the following:

- Environmental Compliance and Voluntary Agreements
- Health and Safety Compliance
- Waste Disposal
- Wastewater Disposal/Treatment
- Air Pollution Control

In most of the smaller SMEs, multi-tasking has been the usual outcome, with environmental duties and responsibilities being additional to regular management and manufacturing jobs such as technical director, site chemist, laboratory manager etc. In the smallest SMEs, as in the UK, specific and direct environmental responsibilities only tend to affect a handful of employees, mainly at the more senior management (e.g. Director) level.

Only in medium-sized SMEs is environmental responsibility delegated to more dedicated middle managers. In the four companies consulted, only the larger company (Oldemarkt) had an Environmental Manager as such and her responsibilities also included Quality and ARBO (health and safety). She had also implemented the companies EMS.

Job Profile - Technical Director (Hyproca Dairy)

Environmental responsibilities include:
- purchasing of equipment;
- general engineering;
- plant maintenance;
- environmental and H&S compliance.

Environmental Competencies:
- regulation;
- environmental review and auditing
- green purchasing (related to equipment)
- energy efficiency (and waste minimisation)
- process optimisation and clean technology

Additional skill requirements:
- waste minimisation
- investment appraisal techniques
- abatement technologies and techniques
- environmental management systems

As in the UK, it seems that environmental roles are generally seen as being additional rather than integral to existing 'core' roles. There is, however, perhaps a better understanding of the indirect but significant role that non-technical staff can play, for example those in purchasing, marketing etc Interestingly there is perhaps greater consideration in the Netherlands than in the UK of the role shop floor staff can take and the responsibilities that they should be given (e.g. relating to process optimisation).

Within the small sample of companies considered there also tended to be perhaps a better appreciation of the part that environmental considerations play as one aspect of quality management and operational efficiency. One of the four firms consulted had ISO 9000 while another was seeking accreditation, while one had an EMS and two were working towards an accredited EMS (ISO 14001). In some of these firms environmental education and training is seen as part of the mainstream training process, being considered alongside health and safety, quality etc.

4.3.3 Environmental Skills and Competencies

As noted in Part B, if companies are to benefit from environmental improvement, they require skills and knowledge in many, if not all, of the following areas:

- Regulatory Requirements (environmental law);
- Environmental Impact Awareness
- Monitoring Techniques;
- End-of-Pipe Abatement Technologies;
- Environmental Review/Auditing;
- Environmental Management Systems/Frameworks;

- Energy Efficiency Techniques and Measures;
- Waste Minimisation Techniques and Measures;
- Statistical Analysis Techniques;
- Design for the Environment;
- Process Optimisation/Clean Technology;
- Green Purchasing (products and materials);
- Environmental Investment Appraisal.

Clearly not all skills and competencies need reside in one individual. In fact it is generally desirable for these skills and competencies to be shared as appropriate amongst the various occupations.

Job Profile: Quality/ARBO/Environmental Cc-Ordinator (Oldemarkt-Printer)

Environmental responsibilities include:
- plant maintenance and specification
- process operation
- environmental compliance
- health and safety compliance
- waste disposal
- waste water treatment
- air emissions monitoring
- land contamination

Environmental skills and competencies:
- current environmental regulation
- review / auditing
- investment appraisal techniques
- EMS
- environmental impact
- design for the environment
- process optimisation/clean technology
- data analysis

Additional basic knowledge and skills in:
- waste minimisation
- abatement techniques
- data analysis.

Additional skill requirements:
- green purchasing;
- staff motivation / communication

Interestingly, 3 of the four companies consulted (as opposed to only 1 of the 6 consulted in the UK) did believe that skills/competencies had changed in recent years due to environmental pressures. As in the UK, however, most companies see the environmental skills and competencies as an add-on rather than something integral to various core roles.

In terms of environmental skills/competencies a wide range was noted. Several consultees noted areas where they feel they could use further knowledge and skills, including:

- EMS;
- auditing and monitoring;

- waste minimisation and energy efficiency;
- green purchasing;
- staff motivation and communication;
- environmental investment appraisal.

The BMD national body notes that their regional centres are mainly requested to provide advice and training in terms of:

- legal requirements;
- pollution liability control (e.g. chemical storage);
- environmental management;
- energy efficiency;
- waste minimisation.

Overall there appears to be more interest in the more proactive areas of environmental management in The Netherlands than in the UK, where the more reactive areas (regulation, impacts etc.) dominate to a greater extent.

4.3.4 Environmental Training and Education

Needs Analysis, Plans and Budgets
Any form of systematic or formal Training Needs Analysis (TNA) is very rare in small Dutch SMEs as it is in UK SMEs. Of the companies consulted, none had carried out any formal training needs analysis for the company as a whole, although two of the four had general staff development/training plans, one with environmental objectives.

Generally needs are identified by staff members and actions agreed where appropriate. Surprisingly none of the companies had a training budget although they did cover the cost of training as and when required. In all the companies consulted, specific training was done reactively in an ad-hoc rather than planned way.

Recruitment and Qualifications
None of the four companies felt that it was appropriate to recruit for environmental skills alone, even at Oldemarkt where the quality, H&S and environment manager had an environmental qualification.

In addition, none of the companies seemed to have any interest in their staff obtaining an environmental qualification in the form of a bachelor, masters or even vocational (MBO/HBO) qualification. As in the UK, most employers do not see qualifications per se as being important. What they are looking for is the competence and, in the case of recruitment, proof of that competence.

Perceived Needs and Current Choice of Provisions

As in the UK, most companies have a fairly clear idea of what they require in terms of the characteristics of the education and training provided. All of the companies consulted want training, education and information provision to be:

- low cost;
- as specific to their needs as possible;
- concise;
- easy access; on-site/local.

These preferences are reflected in the types of training provisions being used, these being very similar in the Dutch case study companies as those in the UK companies:

- ad hoc on-the-job training;
- self-help, in the main through literature, computer disks, video;
- seminars and workshops;
- modular courses, on-site, evening or day release.

In terms of self-help computer material it is worth noting that all of the companies we consulted had quite good IT facilities including CD-Rom, internet access and other appropriate software including spreadsheet and database software. In the main companies are accessing training relating to:

- voluntary agreements;
- environmental management (general and EMS specific);
- waste minimisation.

There also seems to be a strong desire to keep up-to-date with health and safety regulation and to obtain training in quality management systems, the latter perhaps more so than in the UK.
The sources and providers of environmental education and training have included:

- trade journals and other commercial publications;
- trade associations (e.g. KVGO (printing), NZE (soap producers), NZO (dairy));
- business clubs (e.g. Industry Circle of Breedewie) and Chambers of Commerce;
- consultants (in relation to voluntary agreements);
- municipal authorities (the regulator) re. certain aspects of regulation.

Only one of the companies (Oldemarkt, the larger printer) had actively been involved in the Cleaner Production Programme (1), through the innovation centre (Senter). Surprisingly none of the companies had had any assistance from the BMDs or the National Environment Centre (NMC) when in existence. It is interesting to note here that the BMDs have been trying to develop relationships with the sector organisations since 1995 so as to improve their 'market' impact. The NMC also drafted a promotional plan in 1995 to raise the profile of the BMDs through radio and TV advertisement.

None of the companies noted any contact with trade unions with regard to environmental issues. It should be noted, however, that some of the company employees belonged to trade unions (e.g. the Christian National Trade Union, CNV, and the Federation of Trade Unions,

FNV) which had been involved in eco-awareness raising for employees (see Section 2), although not necessarily aimed at specific sectors or SMEs.

While most companies feel they would benefit from additional environmental education and training, most are actually happy with the types of provisions they make use of. Several of the companies noted that, while they were aware of what training provisions were available, there was a bewildering array (from both public and private sectors) and hence it had become very difficult to select what was appropriate for their specific needs.

This view mirrors the situation in the UK where SMEs are bombarded with information on training and education, for provisions that are often inappropriate, hence resulting in 'initiative fatigue'.

4.4 The education and training needs of the regulatory agencies

4.4.1 Roles and Qualification Requirements

As noted already there are three main regulatory agencies in the Netherlands, the national (2nd line) Environmental Inspectorate, the provincial regulator and the municipal regulator (equivalent to local authority environmental health departments in the UK). Collectively they deal with most aspects of pollution control. Water resource issues are dealt with by the water boards.

All bodies employ staff trained to MBO, HBO or degree level, some also having higher masters degrees. In fact there are a number of MBO/HBO courses designed for environmental inspectors, including those from the Van Hall Instituut, Ijmond Colege Contract, SBC Studiecentrum (Utrecht), the Katholieke Universiteit Brabant, Hogeschool van Amsterdam etc.

4.4.2 Internal Training and Education

Perhaps surprisingly, none of the regulatory bodies, not even the national Inspectorate, has any sort of internal training organisation in place. Training of staff is carried out on an ad hoc basis by inspectorate or VROM staff. Meetings are regularly held to discuss new initiatives, legislation etc. In general explanatory documentation would be provided by VROM as a starting point. While not the norm, external consultants are used occasionally to provide specific technical training. One recent example of this has been training relating to the reduction of NOx at source.

Provincial and municipal authorities are educated and trained in a similar fashion, through documentation and occasional seminars and meetings, often held centrally by VROM in the Hague. The Association of Provincial Authorities (IPO) in the Hague has also developed a course for provincial officials entitled 'Stimulating Environmental Management in Companies'. This course supports officials in their efforts to stimulate the implementation of company environmental management in their everyday work. The course thus contributes to the creation of a situation in which as many authorities as possible (provinces and municipalities) are disseminating the principles of environment management. The course also increases the degree of harmonisation between licensing, enforcement and company environmental management.

Overall the relatively ad hoc approach to regulator training perhaps reflects the fact that the system is largely self-regulating, with consultants being used to monitor the success of programmes such as the Cleaner Production Programme, EMS implementation etc.

4.4.3 External Training and Education

The national Inspectorate has an international arm which does conduct training and education overseas, but not within the Netherlands itself. This role is carried by the BMDs and the Senter, although Inspectors are expected to at least signpost sources of information/programmes, for example regarding cleaner production.

4.5 Provision of environmental education and training

4.5.1 Overview

While The Netherlands has not adopted the more direct command and control approach taken in the UK to environmental regulation, it has made concerted efforts to encourage and support the uptake of environmental management systems, clean production etc. particularly during this decade.

There has been considerable support given to industry-oriented public sector organisations (the BMDs, Senter etc.), generally through VROM. Higher education institutions and a range of private and voluntary sector training providers have also been keen to develop environmental management courses to meet at least perceived demand. As already noted, there are also vocational qualifications (MBOs/HBOs) which cover environmental management.

The sections that follow concentrate on the provision of most relevance to SMEs, in particular those in the Overijjsel region.

4.5.2 University and College Degree Courses

As part of the study, a brief review was conducted to establish the range of environmental courses offered by higher education establishments in the Overijsel region to bachelor or masters standard. The most important establishment in the region is the University of Twente, although there are some colleges also offering degrees.

University of Twente

The University of Twente (UT located between Enschede and Hengelo) offers a wide variety of first phase undergraduate programmes to approximately 6000 students. The normal duration is 4 years. Undergraduate offerings include a multidisciplinary programme in Environmental Technology. UT also offers nine postgraduate programmes in technological design. These are 2-year programmes geared to the need in industry for highly qualified engineers able to control all stages from research to production and hence of relevance to clean production and waste minimisation. In addition, UT offers various MBA and other Master's programmes. Postgraduate courses can be tailor-made to the needs of each particular organisation.

UT includes the *Centre for Clean Technology and Environmental Policy (CTSM),*the interfaculty institute for environmental studies since 1988 and is the key environmental research establishment in the region. The centre runs two environmental post-graduate programmes, both designed for the unemployed:

- Master of Environmental Business Administration (MBA)
- Environmental Public Management

The institute is hosting the European Office of the Greening of Industry Network. The board of the institute consists of representatives from science, government and industry.

Colleges

Table 4.1 below indicates the involvement of local colleges in environmental education and training at degree and MBO/HBO level. It is interesting to note that only two of the ten have environmental programmes of any sort (including MBOs/HBOs).

Table 4.1: *Environmental Courses from Colleges in the Overijjsel Region*

Christelijke Hogeschool Windesheim (Zwolle)	No environmental programmes
Gereformeerde Hogeschool	No information available
Katholieke PABO Zwolle	No environmental programmes
Reformatorische Hogeschool	No environmental programmes
Hogeschool Larenstein (Deventer)	*Bachelor programmes (full-time):* • Land, Water and Environmental Management *Master programmes (full-time):* • Master of Science in Environmental Management • Master of Innovation
Hogeschool Ijselland (Deventer)	*HBO programmes (part-time)* • *Environmental Science* • *Environmental Technology* *Bachelor programmes (full time)*: • Environmental Science • Environmental Technology • Environmental Material Technology *Master programmes (full time):* • Environmental Technology
Hogeschool Edith Stein / Onderwijscentrum Twente	No environmental programmes
Hogeschool Enschede	No environmental programmes
AKI, Akademie voor Beeldende Kunst (Enschede)	No environmental programmes
Chr. Hog. voor de Kunsten Const. Huygens (Kampen)	No environmental programmes

As can be seen from the table, the Hogeschool Ijselland (in Deventer) is particularly active in the environmental education and training field. It is worth noting that its Masters Programmes are in association with the Universities of Greenwich and Hertfordshire in the UK, the latter being quite innovative in this field as indicated in Section 3.

Distance and Open Learning

As in the UK, the Open University (with its headquarters in Heerlen), has been at the forefront of distance and flexible learning. The OU runs several bachelor courses in environmental subjects and one masters course of particular relevance, Environmental

Decision Making (as in the UK). Unlike the UK Open University, the Dutch OU has study centres in each of the regions, facilitating industry use.

It is also worth noting the Teleac Foundation which has run television courses in Cleaner Production on behalf of the Cleaner Production Programme. These were run in 1992, 93 and 94. ratings as high as 160,000 were reached during Tuesday showings in 1993.

4.5.3 Vocational Qualifications (MBO/HBO)

The Dutch system of vocational qualifications covers a wide range of relevant subjects and there are various courses and providers of part-time environmental MBOs and HBOs. A national listing (provided by LDC in Leeuwarden), indicates 21 environmental MBOs of relevance to industry (e.g. environmental technology, co-ordination, management) and 11 HBOs (mostly Environmental Science and Technology). There are also additional environmental HBOs and MBOs of relevance to other sectors (e.g. the regulators). It is worth noting that there is a national register for MBOs; CREBO.

With regard to the Overijsell area, the Hogeschool Ijselland offers the HBO course in Environmental Technology which, while 4 years long in duration, actually involves only night class study to make it more accessible to those in work. Ijmond College Contract (a private sector provider) offers a part time Environmental Technology MBO for Industry and Local Government and a part-time Environmental Co-Ordinators MBO, in each case taught in Deventer (and at other locations across the Netherlands) through 40 lessons spread over a year.

Similar MBO/HBO courses, generally 30 to 40 units, are offered by various organisations around the country including commercial providers such as Toptech, TLE Contract (Eindhoven) and the Van Hall Instituut (Groningen, Leeuwarden - HBO through night classes). It is worth noting that there is also an interesting MBO course run by the Apeldoorns College, entitled Environmental Techniques for Operators, aimed at shopfloor staff. While an MBO, this course only involves 12 lessons or units.

Finally it should be noted that the BMDs and Senter get involved in developing and teaching certain MBO courses (in addition to their own training activities), providing expertise of relevance to industry.

4.5.4 Business Support Organisations (including trade associations and unions)

Trade and industry organisations, the BMDs/Senter and to a lesser extent trade unions, play an important role in environmental training and education in the Netherlands as in the UK, through providing a wide range of self-help material, seminars, workshops and courses. It is important to note here that the regional BMDs work with Chambers of Commerce, trade associations, colleges etc. to deliver appropriate provisions.

As in the UK small companies rely quite heavily on trade associations to keep them informed in a sector-specific way. The evaluation of CPP 1 indicated that 59% of SMEs in the programme would approach trade and industry associations for information. The Government (44%) and Chambers of Commerce (28%) were also seen as important providers of information.

Numerous examples are given below in Box 5.2 of the sorts of environmental education and training projects that have been conducted with public funding during the 90's, some

specifically aimed at SMEs. It is particularly interesting to see the development of courses dealing with greater integration, for example between health and safety, quality and environmental management. It is also interesting to see that employee unions are actually making efforts to raise environmental awareness amongst employees and get them involved in environmental management. In this respect the Netherlands is significantly different to the UK where there is little trade union activity in this regard.

While many of the projects have evidently been useful and have encourage increased uptake of environmental management systems etc. there is still a degree of fragmentation, despite the co-ordinated efforts surrounding the CPP. While more streamlined than in the UK, unions and trade associations continue to pursue their own initiatives. The same effect has occurred in the UK, often resulting in confusion and initiative fatigue amongst SMEs.

The Cleaner Production Programme 2 (CPP2) will continue to address the problem by offering a good degree of co-ordination through the BMDs and trade associations. CPP2 is aimed specifically at SMEs and the main themes, eco-design, environmental technology, EMS, waste prevention and energy efficiency. To simplify things, all five topics are integrated into one 'environmental management' package.

Box 4.6: *Publicly-Funded Environmental Education and Training Projects*

Christian National Federation of Trade Unions (CNV) in Utrecht
Duration: January 1990-December 1993
Aim: to raise the level of eco-awareness amongst employees and to encourage the implementation of company environmental management.
Output: regional training courses six times a year plus 'theme days'.

Euro Info Centre of the Central Netherlands in Utrecht
Duration: December 1994-May 1996
Aim: to improve EMAS participation;
Output: production of a self-help EMAS 'Eco Management Guide' and software package.

Federation of Netherlands Trade Unions (FNV) in Amsterdam
Duration: January 1989 - January 1991
Aim: to raise eco-awareness of trade union members.
Output: compilation of documents, regional meetings and study days on environmental management; 'Working cleaner means working better'.

Industrial Workers' Union (affiliated to the Federation of Netherlands Trade Unions, FNV) in Amsterdam
Duration: September 1991 - May 1992
Aim: to assist in environmental management work;
Output: production of an Environmental Guide analogous to the Guide to Safety, Health & Welfare. The guide allows mapping of environmental problems and is aimed particularly at the chemical and metal sectors.

Institute for Environment and Systems Analysis (IMSA) in Amsterdam
Duration: September 1992-April 1994
Output: in-house interactive training course on 'Environmental Policy and Environmental Management', an in-house course for companies, groups of companies and sectors of industry. Participants can put together their own course package, selecting from five modules: chain management and ecobalances, environmental policy and internal organisation, company and environment, communication and conflict, and green marketing.

Dutch Institute for the Working Environment (NIA) in Amsterdam
Duration: October 1990 – ongoing
Aim: greater integration of health and safety, environmental and quality management.
Output: practice-orientated training programme for safety experts entitled 'Environmental Management in Companies'. This course was based on the idea that the working conditions (health and safety) expert is a useful intermediary in the introduction of environmental management. In 1996 the NIA organised further courses based on this programme including an 'Environment Coordinator' course.

Cooperating Chambers of Commerce and Industry for the Province of Utrecht, Utrecht College of Higher Education and the Utrecht Technology Centre
Duration: December 1989 - June 1990
Aim: to encourage the implementation of environmental management in small and medium-sized businesses.
Output: EMS course for SMEs, covering how to develop an Environmental Business Plan (MOP) tailored to the specific company situation, using specific examples.

National Centre for the Environment (NMC) in Woerden
Duration: January 1992 – 1997
Aim: to support companies in the implementation of an environmental management system.
Output: Environmental Co-ordinator's Course/Handbook. Experts with years of practical experience tackle a wide range of topics. There is an alternation of theory and practice.

Association of Chambers of Commerce and Industry in the Netherlands (VVK) in Woerden
Duration: December 1994 - September 1995 (evaluation in 1996)
Aim: to assist Chambers of Commerce to improve their communications on the subject of environmental management.
Output: Environmental Communications Handbook for Chambers of Commerce. This handbook contains, in addition to hard advice and practical examples, a step-by-step plan that steers the user through the communications phase, particularly with regard to SMEs.

Food-Processing Workers' Union (Utrecht)
Duration: October 1991 - December 1992
Aim: to improve environmental awareness in the food processing sector.
Output: 'theme days', information days and handbook, aimed at different sub-sectors and different environmental problems.

In terms of uptake of such programmes, the CPP evaluation established that 4,495 delegates had attended 118 CPP seminars, while 110 individuals had attended the 8 courses run by the NMC/regional BMDs. In addition many companies were involved in the IMPRES training sessions, while around 170 individuals participated in the sector-specific courses run for the coatings industry. In terms of SMEs specifically, 28% of companies had sent staff to CPP events and courses.

Most encouraging of all is the fact that around 40% of companies (as a whole) had actually done something with the information that they received and that in the SMEs, 35% had subsequently done some energy conservation work and 42% had actually adopted some form of cleaner technology.

4.5.5 Supply Chain Activities

As in the UK, large companies such as Shell and Philips are beginning to make increasing demands on suppliers with regard to environmental management and performance. To some firms this is a natural extensive of quality management and the use of supplier auditing to ensure that correct standards are being applied.

Few companies, however, are providing anything other than occasional information and assistance to suppliers. Interestingly the CPP evaluation noted that 82% of SMEs said that they obtain information from customers/suppliers. There appear to be no examples of direct assistance of SME suppliers, such as that provided by Rover and Jaguar in the UK.

4.6 Summary and conclusions

While the research has been less comprehensive than that in the UK, and the company consultations fewer, we believe that the following summary gives an accurate overall picture of the situation in the Netherlands.

4.6.1 General Needs and Main Drivers

SMEs make a significant contribution to the Dutch economy and almost certainly to environmental damage and resource consumption. Many smaller SMEs choose not to get involved in the various voluntary agreements and hence can continue to operate using environmentally damaging practices (within the confines set by the basic regulation, for example governing effluent discharges). As in the UK many SMEs also tend to be wasteful of resources, despite the fact that they often operate with very tight profit margins. While CPP 1 has done much to address these problems, there remains a strong need to reduce wastage and pollution, for the sake of the environment, to strengthen competitiveness and to secure and increase employment.

Regulation, pressure to contribute to voluntary agreements and concern over liability issues are the most important concerns for SMEs, although cost saving, through energy efficiency and waste minimisation, has become far more prominent as a driver as a result of the CPP, the work of the BMDs etc. It is probably the increasing interest in waste minimisation and cleaner production, either directly or through EMS, that are driving the demand for environmental education and training.

4.6.2 Responsibilities, Skills and Competency Needs

As in the UK, key environmental responsibilities rest with health and safety, quality and production/technical staff in medium-sized SMEs and with a technical director or MD in the smaller SMEs. Multi-tasking is the common approach with environmental roles and responsibilities being added to existing 'core' business responsibilities. As in the UK, the latter are largely seen as being the most important, with environmental responsibilities being secondary. Some medium sized SMEs, however, do however take a more integrated approach and in some cases employ specialist environmental or HS&E managers. Unlike the UK, there is better awareness of the need to educate shop floor staff, perhaps as a result of greater union involvement.

Interestingly, the Dutch SMEs that we consulted see the key skills and competencies as being those associated with EMS and waste minimisation rather than regulation per se. They also appear to have more interest in more indirect skills and competencies, for example relating to product design or purchasing. As in the UK, environmental skills and competencies tend to be 'grafted-on', i.e. staff are recruited as they always were for their core skills and then trained in the additional environmental areas.

4.6.3 SME Activities and Preferences

As in the UK, environmental training and education is mostly conducted in a reactive and ad hoc way, with very few companies using any form of TNA or making specific provisions in terms of budgets or staff development plans. While most SMEs do not see qualifications as being important per se, some medium-sized SMEs are employing environmental managers with environmental degrees etc.

While only one of the companies we consulted has been involved in the CPP (through a Senter), the national data suggests that significant proportion of SMEs have made use of the programme and the regional services offered by the BMDs, Senter, trade associations etc.

The training itself is still dominated by self-help, on-the-job and informal internal training, topped up by external seminars and short courses. In the main companies are accessing training relating to:

- environmental management;
- waste minimisation.

The consensus is that training provisions need to be low cost, very concise, modular/flexible, sector specific and easily accessible. The range of providers is less diverse than in the UK and includes:

- trade and industry organisations (and to a small extent unions);
- the BMDs/Senter;
- colleges and commercial providers.

4.6.4 The Regulators

The regulatory regime is more fragmented than in the UK, being divided into the municipal, provincial and national levels. While there are courses specifically designed for inspectors, internal training is limited to ad hoc provisions in the form of self help literature (e.g. from VROM) and meetings/seminars.

4.6.5 Support and Provisions

Strong and clear mechanisms and initiatives are in place to raise awareness and promote training provisions and benefits. The CPP 2 is the most important programme, the key being its well co-ordinated delivery through the dedicated Company Environmental Service providers (the BMDs) and Senter. While comparisons can be drawn with the UK's Environmental Technology Best Practice Programme (ETBPP) and Business Link, the former is national (with regional links, seminars etc.) while the latter is general business support rather than specific environmental support.

While one can note that the BMDs and Senter do not in themselves provide an integrated business support service, the Dutch system does seem simpler and more direct than the approach taken in the UK. Overall it seems that this 'branded' network of publicly-supported bodies provides a less confusing environmental support mechanism for SMEs.

As in the UK, there is no shortage of academic and vocational environmental courses (particularly MBOs), seminars, workshops etc. being provided by higher education establishments and various trade/industry, public sector (Senter), not-for-profit and commercial organisations. Many of these courses and other provisions are specifically tailored for SMEs, for example through being short, modular, distance learning-based etc., and in some cases sector-specific with trade association involvement.

4.6.6 Barriers

Uptake of EMS and demand for environmental education and training, while good compared to the UK, is still lowest amongst small and micro SMEs. While considerable efforts have been made, and successes achieved in the Netherlands, certain barriers remain difficult to

overcome. The most important of these remains resources constraints in terms of money and time.

Encouragingly, the type of education, training and support provided seems to be starting to bring down some of the barriers still prevalent in the UK. There certainly seems to be better awareness of the benefits of environmental management in competitiveness terms.

4.7 The way ahead - recommendations

While not all SMEs have positive attitudes to environmental improvement, the Dutch approach to environmental education, training and support, combining quite active sectorally and regionally led initiatives, appears to be reasonably successful, reaching an increasing number of SMEs.

As with all things, however, improvements could be made, particularly in terms of encouraging/supporting the smaller SMEs who remain the most difficult to reach. CPP2 is now in full flow, being particularly aimed at providing simplified messages and support to SMEs in particular.

Not surprisingly, many of the recommendations that apply to the UK also apply to the Netherlands. In most cases it is a matter of degree, the Netherlands being in many respects just a few years further down the same road. Overall we would tentatively recommend:

- *better co-ordinated and planned training for the regulators*, perhaps making use of the UK Environment Agency model;
- *continuing promotion of environmentally-related cost benefits*, in particular to smaller SMEs, through provision of sector-specific case studies and detailed environmental review work;
- *the greater use of environmental training needs assessment (TNA)*, in particular focused on competitiveness issues including waste minimisation and energy efficiency;
- *the continuing development of environmental MBOs/HBOs and the integration of environmental management ideas into other standards* (e.g. those relating to manufacturing processes).
- *the continuing integration of environmental, health and safety and quality management methods and systems*. Waste minimisation and energy efficiency, for example, should be promoted as an integral part of good business practice and TQM;
- *continuing development of SME-appropriate and sector-specific provisions;*
- *the continuing provision of hands-on, practical and regionally-based support through the Senter and BMDs;*
- *the greater use of low-cost direct training/support activities*, for example through graduate placement schemes (as an addition to BMD activity, subsidised consultancy etc.).
- *greater encouragement for supply chain initiatives*.

While far from perfect, in many ways the Dutch model represents a good and reasonably successful one for other Member States to follow, offering a streamlined, direct and practical approach to SME environmental education, training and support.

