ENVIRONMENTAL MANAGEMENT AND AUDITING - RELEVANT ASPECTS OF ITS DEVELOPMENT AND IMPLEMENTATION

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by

Martin Beirne

Supervised By

Dr Richard Thorn

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DEDICATION

This thesis is dedicated to the hope that it might in some small way contribute to a healthy environment for the "two young men" who so regularly interrupted its preparation - God bless them and keep them interrupting!

DECLARATION

I declare that this dissertation is submitted now for the first time to the NCEA, and I also declare that it has not been previously published or submitted to any other body.

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ABSTRACT OF THESIS

The concept of Environmental Management and Auditing (EMA) is one that has only come to prominence in recent years but is fast gaining momentum.

EMA is part of a series of environmental protection measures which have evolved because of the recognised failings of previously accepted pollution "treatment" measures. These new measures are aimed at "prevention" of pollution and at the wise use of resources.

The EMA concept has been evolving since the mid 1970's. The original concept had many applications but no set procedure. Its value as an environmental protection measure has given rise to a need for formalisation and standardisation. These formal standards facilitate widespread application of the EMA concept and a means of comparing the environmental management performance of individual companies.

At present there are basically two separate types of EMA schemes:

- National Standards, such as the Irish Standard I.S. 310 and Britain's B.S. 7750.

- The EC's Environmental Management and Auditing Scheme (EMAS), which has Community-wide application.

All of these schemes are very recent in origin, have voluntary application and have inherently similar procedures and requirements. The recent origins of these schemes means that they are as yet undergoing a type of experimental phase in relation to their practical application. The schemes have also to overcome the type of reluctance that faces any new initiative as regards awareness, understanding and uptake.

Because the individual schemes are so similar, the experience gained in relation to each scheme can be inter-related. Given that the basic aim of these schemes is one of formalization and standardisation there appears to be a major inconsistency in the fact that no formal scheme of Auditor qualification exists. An adequate auditor qualification system must be given urgent attention and must be capable of International application.

There is general agreement that implementation of recognised environmental management and auditing schemes will be vital for future environmental protection. There is equal recognition that future business survival will depend on companies being able to display compliance with such schemes. It is also accepted that these schemes will create new market opportunities for environmental protection technology, goods and services.

From a national viewpoint it is therefore essential that countries implement these schemes as efficiently and speedily as possible, so gaining competitive advantage. In Ireland's case, this will necessitate a thorough analysis of what barriers the schemes will face, followed by positive action to overcome these barriers. Such action demands that issues such as company awareness, cost/benefit justification and demonstration projects, be addressed.

The biggest obstacle to uptake of Environmental Management and Auditing in Ireland lies in the nature of the industrial base. Ireland has a predominance of small to medium sized companies. All evidence so far gathered from studies of the schemes implementation shows that small and medium sized companies found the cost of initial implementation to be the most prohibitive factor encountered.

Within the EC, Ireland is the only country that does not have a State scheme to subsidise environmental protection measures. There is therefore an urgent need for State financial aid to companies undertaking Environmental Management and Auditing Schemes..

The EMA concept coincides with a number of similar themes relating to disclosure of information, pollution prevention, integrated pollution control, etc. As such, there is ultimately a need to rationalise, condense and streamline these initiatives.

Although EMA is still only in the development phase, it is vital from an environmental and economic viewpoint that the concept be recognised as an essential element of future environmental protection policy. It therefore deserves to be afforded high priority by all parties concerned.

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CHAPTER I - INTRODUCTION

1.1 INTRODUCTION

One of man's great driving forces is his yearning for progress. This is true of his endeavours in all fields of life, sport, education, religion, industry etc.

Very often the pursuit of progress in one field can have detrimental effects in another. Whilst this can sometimes be attributed to deliberate oversight, it can most often be caused by a combination of haste, lack of knowledge and poor management practices. Very often the detrimental effects that arise can raise serious questions as to the viability of the actions that perpetrated them.

Mankind's use of nature as a means of assimilating pollution is a prime example of the foregoing. The quest for industrial and economic progress has resulted in pollution problems that have recently given rise to a serious re-think on the traditional ways of producing goods and disposing of waste. This re-think has resulted from a combination of on-going pollution problems, increased environmental understanding and awareness, and pressure from consumers and the growing environmental movement.

Planners and developers have therefore had to adjust their agenda in response to the need for environmental protection. The new agenda gives due recognition to the concepts of sustainability and environmental management, along with the traditional motives of progress and growth.

Recognition of the trans-boundary or global consequences of pollution has also become embedded in modern day environmental thinking. This recognition demands that all nations play their role responsibly.

Fundamental to these new understandings is the acceptance that systems of environmental management are needed, together with a means of checking on how environmental management is performing. Because of this, the concept of having a recognised scheme of Environmental Management and Auditing (EMA) has come about.

Part of the difficulty that has arisen with this concept is that of the great diversity of business operations and their environmental effects. This diversity, coupled with the "global" aspect of environmental protection have necessitated that:

- EMA systems become formalised, in a manner that can be applied to a wide range of companies and provide a means for comparison of individual company performance.

- Such systems be standardised for widespread and preferably for global application.

1.2 AIMS AND OBJECTIVES

In outlining the aims and objectives of this thesis the first issue to address is that of the scope of the exercise.

At present the concept of EMA is undergoing rapid development. A consequence of this is that there are numerous issues of importance, e.g. the schemes relevance, uptake, implementation, administration, standardisation, and many more. It would not be possible to cover all these issues within the scope of this thesis.

It is intended initially to put the issue in context by explaining the history and developments of EMA, including the underlying reasons for its development. Further context will then be provided by explaining the necessary progression of the concept from an informal and undocumented beginning to standardised EMA schemes. This explanation will include a description of the various uses that have been made of the EMA concept and the need for a standardised system, to be applicable over this range of uses.

The present EMA position will then be dealt with by outlining:

- The major schemes that are now emerging.

- The advantages and disadvantages for companies applying these schemes.

- Similarities and differences between the schemes.

- Problems so far experienced in their application.

An analysis of the reasons why these separate but inherently similar schemes have come about will also be provided. The schemes dealt with are:

A. The EC's Eco Management and Audit Scheme (EMAS).

B. The British Standard B.S. 7750.

C. The Irish Standard I.S. 310.

Having outlined the difficulties experienced in applying the schemes it is then intended to highlight what appears to be one of the major inconsistencies of the EMA scheme, namely, lack of professional qualification criteria for Environmental Auditors.

A reasoned attempt will then be made to suggest a suitable scheme of auditor qualification that meets the requirements of the EMAS scheme as regards consistency, standardisation and international application.

The question of uptake of the EMA concept in Ireland will then be addressed. It is proposed to justify the application of the EMAS scheme in Ireland and identify the obstacles that exist. This is followed by making suggestions on a national policy for the uptake of EMAS that directly addresses the obstacles identified.

Finally, it is intended to draw conclusions and make further recommendations concerning issues relating to overall rationalisation and implementation of the EMA concept.

CHAPTER II

CHAPTER II

EVOLUTION AND DEVELOPMENT OF ENVIRONMENTAL MANAGEMENT AND AUDITING

2.0 INTRODUCTION

This chapter is a review of how the concept of EMA has evolved. The chapter outlines the circumstances and reasoning that brought the concept to its present position and provides a foundation for more detailed discussion of the title subject in following chapters.

2.1 HISTORICAL CONTEXT

One of the basic laws of physics states that "for every action there is an equal and opposite reaction". From an environmental science viewpoint the same law is equally applicable.

For centuries the restorative properties of nature have been taken for granted. Initially, the problems that such exploitation created were confined, both in nature and extent, e.g. London smog, pollution of the River Rhine etc. This type of localised pollution coupled with a lack of scientific knowledge resulted in localised solutions becoming acceptable. The real consequences of these actions only began to emerge in the latter half of the twentieth century. There were 3 principal reasons for this:

1. Damage to and depletion of natural resources, such as, destruction of animal habitats and species, eutrophication, coastal and urban pollution.

2. Improved scientific knowledge and technology led to the possibilities of establishing definite cause and effect relationships. One such example being the linking of harmful doses of radiation to various cancers.

3. Environmental disasters such as Bhopal, Chernobyl and Three Mile Island, raised public awareness to new levels. These disasters also focused attention on the ever increasing threats to environment and health being posed by modern day development.

Boutwood and Bell (1986) state that in the last few decades, the scope of environmental concern shown by the public has broadened. Pollution concerns have also given rise to the establishment of many environmental groups. These groups highlight issues such as planetary resources, acid rain, and rainforest destruction. In so doing they focus attention on the need for appropriate remedial action.

2.2 REACTION TO POLLUTION PROBLEMS

2.2.1 Initial Reactions to Pollution

Mankind's initial reaction to pollution problems was to try solving them on his own terms. A phase of developing elaborate legislative and abatement procedures commenced.

In spite of these efforts pollution problems escalated. Issues such as acid rain, ozone depletion and urban pollution, were steadily getting worse.

2.2.2 Chain Reactions

It was becoming obvious that man's reactive policies were failing and that one reaction was leading to another in a type of chain pattern that could continue indefinitely. Technical solutions aimed at meeting standards set by legislation were proving ineffective. According to the Green Book (1991) this growth-centred approach continued confidently into the 1960's. At the same time, environmental groups and the media were discovering that an increasingly well educated and concerned population were easy to convince. According to NSCA (1990) the first populist environmental book - "Silent Spring" by Rachael Carson, was published in 1962 and immediately captured the public imagination.

2.2.3 A Change in Environmental Policy

The era of "Green" politics began and proved to be a major influence on national and international policies. Politicians and developers alike found that their agendas' were being set by consumers, investors, educationalists and financial establishments. The traditional attitude of environmental protection being an unwanted and expensive burden began to change. Bowlby and Lowe (1992) concluded that there has been a

gradual shift towards the view that humanity must learn to live with rather than exploit nature.

2.2.4 Consumer and Legislative Pressure

A further factor was the increase in living standards experienced by most people. More time and money was available to enjoy the natural world. Increased incomes also meant that people could be selective in their purchasing policy. This led to the development of markets for environmentally friendly products, perhaps the most obvious example being the demise in acceptability of CFC aerosols. According to Vernon (1992) many firms now see market pressures as the main driving force on environmental issues, with potential business opportunities in the development of new products and services. This demands a different approach to the environment, involving managerial and market-related solutions. Regulatory controls are also changing, with an emphasis on continual improvement of performance across all areas, rather than simply meeting a few specific standards. According to the EC "Towards Sustainability" policy document (1992) the Community's previous action programmes relied almost exclusively on legislative measures, but this emphasis must now change to incorporate measures involving a mix of:

- Legislation.
- Market-based instruments, designed to sensitise both producers and consumers towards responsible use of natural resources.
- Research, development and education on environmental concerns.
- All of the community's financial support mechanisms being geared towards environmental responsibility.

2.2.5 The Pro-Active/Management Approach

What has emerged is a more pro-active approach to supplement/replace the previous re-active ones. Vermon (1992) states that industrialists world-wide are changing their traditional business approach and are showing a new attitude that gives full and serious consideration of environmental matters, giving them parity with issues like quality control, research and development and staff relations.

Environmental Management has thus become an integral and commercially vital part of overall company management and performance.

2.3 DEVELOPMENT OF ENVIRONMENTAL AUDITING

2.3.1 Evolution of Audits

Alongside and complementary to Environmental Management has come Environmental Auditing.

According to European Environment Supplement (1991) this concept appears to have originated in the US in the 1970's, as a response to domestic liability laws. A leakage of pesticides from a manufacturing plant caused immediate environmental and health problems. The follow-up investigation involved a very extensive analysis and assessment of environmental management and practice at the site. Parallels were drawn with the rigorous procedure of financial audits. Thus, the word Environmental Audit (EA) came about.

2.3.2 The Development of Auditing

American authorities were so impressed by the effectiveness of the EA process that by 1980 a further three companies were directed to carry out similar procedures. This was a means of demonstrating the extent of compliance with legal standards.

The EA practice has gradually become widespread. Environmental Auditing is presently being accepted internationally. Gouldson, Russel and Welford (1993) state that EMA has become one of the most important concepts in industry in the 1990's.

CHAPTER III

CHAPTER III

FORMALISATION OF ENVIRONMENTAL MANAGEMENT AND AUDITING

3.0 INTRODUCTION

This Chapter leads on from the evolutionary theme of chapter II. Chapter III demonstrates how EMA has had to become formalised in order to gain international recognition as a standard against which company performance can be measured.

3.1 EARLY ENVIRONMENTAL MANAGEMENT AND AUDITING

As can be appreciated, any initiative such as EMA that comes about in an evolutionary manner does so without any formal ground rules, agenda, format or application standards. It seems appropriate to quote from Lewis Carrolls - "Through the Looking Glass", when the character known as "Humpty Dumpty" says, "when I use a word it means just what I choose it to mean: neither more nor less". Industry's initial utilisation of the EA concept is summed up rather nicely by the above quote. What arose was a profusion of different audit types. The distinguishing factor appears to be the purpose for which the auditing process was used.

Environment Business Supplement (1991) states that it is possible to conduct an EA of a variety of activities be they projects, strategies, products, systems or fixed installations. Organisations as diverse as Banks, Shop Companies, Power Companies and Public Authorities have all undertaken some form of EA.

3.2 TYPES OF AUDITS

3.2.1 Introduction

A description of some of the more commonly adopted types of audit will help illustrate this diversity of application.

3.2.1.1 Compliance Audits

Proof of compliance with legislation appears to have been the original purpose of EA. Environmental Business Supplement (1991) describes Compliance Auditing as probably the most common form of EA. It is a true audit insofar as it is a checking process whereby a company establishes the extent to which it is complying with environmental laws and/or company policies. More elaborate compliance audits may extend to anticipate stricter standards and cover areas not yet legislated for. They thus form the basis for a more pro-active strategy. Compliance audits have the advantage of being relatively straight forward, but they are time consuming.

The procedure usually involves an in-depth analysis of licence conditions and some form of scoring system for company compliance.

3.2.1.2 Process Safety Audits

This type of EA seeks to identify the hazards and quantify the risks arising from production processes. Emphasis is placed on emergency response procedures such as fire-fighting, evacuation procedures, staff training, accident reporting, etc. Stricter Health and Safety legislation has been the main reason for developing this type of audit. The need to avoid accident damage claims has also been a factor. In addition to meeting legislative standards, a safety audit easily identifies with financial savings.

3.2.1.3 Due Diligence Audits

These audits are associated with company mergers, acquisitions or disposals. Significant environmental liabilities of the company are assessed. This includes past, present and future liabilities, e.g. contaminated land, existing or potential litigation, or the necessity of installing new environmental protection equipment and procedures. Such audits can have a decisive role in a decision making situation and may form an essential part of a contract arrangement. Due diligence audits must therefore be wide-ranging, thorough and well documented. Solicitors often have a significant input, as also have company accountants. One of the major differences from other Audit types is that information generated is strictly for the parties involved, with no emphasis towards providing information for the legislative authorities or general public.

3.2.1.4 Performance Audits

Also known as "Green Audits". Such audits are usually commissioned by company management to assess how well the company, in its overall performance, is performing in relation to environmental protection. It involves an overall assessment and review of company management, policies, organisation, equipment and procedures.

Performance Audits are wide ranging and do not limit their scope to simply meeting legislative requirements. This audit type is usually carried out by the most responsible companies.

The findings are often made available to authorities and the public as a means of demonstrating responsibility and for PR purposes.

3.2.2 Scope of Environmental Auditing

From the above, it can be appreciated that the term "Audit" can be applied to any of a number of differing procedures. Jacobs (1991) states that any attempt to assess an organisation's activities which looks honestly at both positive and negative features, can be described as an audit. It is possible to evaluate some particular areas of activity, or some environmental topics only. Cook (1991) says that in reality the audit is simply a verification programme, with many audit programmes designed to meet specific objectives. Smith and Billington (1993) conclude that audits can be used in 3 ways, to achieve compliance, to demonstrate compliance, to go beyond compliance. Sykes (1993) describes EA as, "the refinement of everyday thinking - and that tells us to be vigilant". ENDS (1990) states that leading manufacturers have developed a wide array of auditing procedures, serving numerous objectives.

3.2.3 Features of Early Environmental Audits

The foregoing highlights two major features of the developing technique of EA:

1. Adaptability - numerous applications are possible.

2. Lack of standard procedure - a result of its adaptability and developing nature.

In the circumstances both features are unavoidable. Indeed, they can be looked on as a necessary step along the road to acceptability - a type of experimental phase. The

adaptability aspect must be regarded as being highly desirable, given the diversity of business effects on the environment. Against this, a lack of standardisation tends towards having mainly adverse effects. Dodds (1992) says of Environmental Management systems:

> "The management of any organisation, whatever its size and function, needs to be efficient, effective and designed for the purpose it is intended to fulfil. Most people would see such arrangements as systems, arrangements of parts which work together as a whole, designed to move the organisation towards its goals.
>
> There is a need for a systematic approach to managing any organisation. This is best achieved through the creation and use of a written management system, using a recognised "model" which is accepted at least nationally, and preferably at a European or International level. A series of linked parts, following a common core will best service the need and be effective and efficient most of the time."

UNEP (1988) stated that environmental auditing is seen as a necessary and routine part of industrial management, irrespective of company size. While there is no set routine for this, the procedures have become more formalised with time and should continue to do so.

Addressing a seminar in Cork in October '93, Mr Joe Harford, President, FICI said, "we (FICI) are of the view that there is a need to introduce, on a planned basis, environmental management audits". The standards could be agreed with the EPA but subject to independent third party verification.

3.2.4 The Need for Standardisation

Bearing in mind that the concept of EMA has been gaining momentum since the late 1970's, it becomes clear that a time is being reached when some form of standardisation is possible and necessary.

Such standardisation can provide direction and meaning, particularly for those who are considering participation in the concept. In addition, it provides guidelines against which the quality of a management system can be judged.

The idea of such standardisation is not new. General company management and product quality standards have been in existence for many years under the ISO 9000 series. This series has been recognised globally as a means by which companies can show the quality of their efforts.

However, ISO 9000 does not address the Environmental Management aspect of business. The most likely reason for this lies in the comparatively recent recognition of the importance of environmental management and the previous emphasis on strictly commercial aspects of performance. It has to be asked if ISO 9000 would include environmental matters if it were being drafted in present times? The optimistic approach to take is that of seeing no reason why an appropriate environmental management standard can not gain the same acceptance and recognition as ISO 9000.

According to Anon (1992), there is a real danger of reporting being meaningless unless it is monitored and a helping hand offered. The task for the world-wide accountancy profession is to establish some minimum practicable basis for substantial environmental reporting. We are still some way from reporting practice which satisfies this demanding agenda. The time is long passed when companies can be satisfied by "Puff".

3.3 THE CURRENT POSITION

3.3.1 EMA Standards

ISO and the International Electrotechnical Commission have established a joint working group in an attempt to standardise environmental management systems for global application. Simultaneously, many countries, including Eire, have produced their own national standards for environmental management.

According to Environment Business Supplement (1992) the British Environmental Management Standard, BS 7750, is a first for Britain and is expected to herald similar European and International standards. The fact that all of the national standards so far produced follow basically the same format as BS 7750 not only bears out the above assumption, it also shows the degree of consensus that exists regarding these standards.

BS 7750, which was introduced in 1992, has been piloted in a range of business activities and is under review. The experience so gained can provide useful practical guidance for other similar schemes, as well as for BS 7750.

In June 1993 the European Commission introduced their own EMA Scheme (EMAS) Regulation which, in common with the various National Standards, is a voluntary scheme. According to Environmental Business Supplement (1991) this EC regulation will make a direct contribution to the standardisation of environmental management systems and performance indicators, thereby facilitating comparison of company performance.

3.3.2 Context of Existing Standards

Jacobs (1992) states that these two standards, BS 7750 and EMAS, will undoubtedly provide the principle context for the development of environmental protection over the next decade. In a few years time it will be something a company will be proud of and be as commonplace as value for money management is now. Both are designed to establish good environment management practices; the reason being that, if management systems and procedures improve, it is likely that actual environment performance will improve also.

Vernon (1992) describes BS and EMAS as the two major initiatives which aim to strengthen and standardise requirements in this area by setting a pattern for companies wishing to develop environmental management systems.

Emphasis on the existence of two initiatives might give a false impression of completely differing approaches. Such is not the case. An inherently similar procedure forms the "core" of each system, with a different emphasis on elements within this core. The best way of illustrating this is by a description of each procedure, outlining comparisons and differences that exist.

CHAPTER IV

CHAPTER IV

4.0 FORMALISED EMA SCHEMES

4.1 Introduction

This chapter briefly describes the principle EMA initiatives that can be applied nationally.:

1. The EC Eco-Management and Audit Scheme.

2. IS 310, and BS 7750, - respective Irish and British National Environmental Management System Standards.

This Chapter also discusses the differences and similarities that exist between these schemes and attempts to reason why these separate schemes have been introduced.

Experience gained to date from application of these schemes is also discussed.

4.2 EC ECO-MANAGEMENT AND AUDIT SCHEME

4.2.1 General.

Council Regulation (EEC) No 1836/93 was adopted by the Council of Environmental Ministers on 29th June, 1993. It provides for voluntary participation by companies in a community Eco-Management and Audit Scheme.

4.2.2 Early Development of EMAS

Work on the scheme began in 1990 and a discussion document issued in autumn of that year. According to ENDS (1990) it was initially proposed that the scheme would be mandatory and cover 58 industrial sectors. ENDS (1992) reported that a "hurricane" of industrial protests promptly descended on the Commission. The final version is a very different creature from its oldest ancestor. It allows for voluntary participation, from 30 industrial sectors.

The regulation does however contain a provision whereby Member States can extend the scheme beyond the scheduled sectors and particularly to non-industrial sectors and public service organisations. Appendix A (this study) lists the industrial sectors covered by the scheme. From the above, it would appear that the Commission would favour a much stricter and more widespread scheme, but have had to be flexible in their initial approach. It is worth noting that Article 20 provides that, "the Commission shall review the scheme within five years and propose amendments depending on experience gained, particularly concerning the scope of the scheme".

4.2.3 Aims and Principles of EMAS

Department of Environment (1993) describes the scheme as being in keeping with the concepts of "shared responsibility", "incentive based" and "self regulatory measures", contained in the Commission's 5th Action Programme.

In addition to its "voluntary" status, it is significant that this is a "Regulation", rather than a "Directive". A Regulation is directly binding in its entirety and helps to eliminate differences in implementation by Member States. With this approach the Commission are re-inforcing the need for standardisation.

The Commission have also shown flexibility in allowing that companies, at their discretion, can register on a site-specific basis rather than having to register their entire operation. ENDS (1992) concludes that obliging a multi-site company to register all sites in one fell swoop may be asking too much even of the greenest of businesses. "Site" includes all land on which a company carries out their activity at a given location.

Department of Environment (1993) states that the aims of the scheme are twofold:

- Firstly, to stimulate commitment by industry to continuous improvement of environmental performance using a variety of tools including reviews, management systems, programmes, objectives, periodic audits and reporting to management.

- Secondly, the provision of validated, objective information on a company's environmental performance to the public on an ongoing basis.

4.2.4 Important Definitions

Given the title of the Regulation, two of the definitions it provides are particularly relevant:

- "Environmental Management System" - that part of the overall management system, which includes the organisational structure, responsibilities, practices, procedures, processes and resources for determining and implementing the environmental policy.

- "Environmental Audit" - a management tool comprising a systematic, documented, periodic and objective evaluation of the performance of the organisation management system and processes designed to protect the environment with the aim of facilitating management control of practices which may have an impact on the environment, as well as, assessing compliance with company environmental policies.

4.2.5 EMAS Scheme Details (see Figure 1)

4.2.5.1 Requirements of the Scheme - Initial

While participation is voluntary, once a company decides to seek registration under the scheme certain measures must be taken. These measures are comprehensive and on a site by site basis as follows:

- adopt a written environmental policy committed to continual improvement of environmental performance (in addition to compliance with relevant statutory requirements),

- conduct an initial review of the environmental aspects of a company's activities on the site,

- establish environmental protection programmes to achieve specified environmental objectives, these are mainly based on the findings of the review,

- introduce an environmental management system to ensure that the objectives of the programme can be achieved,

- prepare an initial environmental management statement for the public, written in a concise and comprehensible form; article 5 of the Regulation stipulates what a statement must include; some of the more important items are:

  - an assessment of all the significant environmental issues on the site.

  - a summary of the figures on emissions and raw material, energy and water consumption.

  - details of the company's environmental policy, programme and management system for the site.

  - other factors regarding environmental performance.

  - the date of the next statement.

- have the statement validated by an accredited verifier.

- submit the validated statement with the appropriate registration fee to the designated competent body, and

- following registration, disseminate the validated statement to the public.

Figure 1: THE EMAS SCHEME IN SUMMARY

STEP 1 Company makes an INITIAL ENVIRONMENTAL REVIEW (IER) for the site considered

STEP 2 In the light, i.a., of the IER, company's management establishes an INTERNAL ENVIRONMENTAL PROTECTION SYSTEM for the site considered

STEP 3 Company prepares an INITIAL ENVIRONMENTAL STATEMENT for the site considered

STEP 4 The IER process and the statement are VALIDATED by an Accredited VERIFIER

STEP 5 Company NOTIFIES the Competent Authorities, in view of REGISTRATION under ECO-AUDIT of site considered. The Initial Statement is communicated to the Authorities and kept at the disposal of the PUBLIC

STEP 6 The site is registered by the Competent Authorities

ROUTINE 1 Company makes periodic ENVIRONMENTAL AUDITS of activities in the site considered according to the Audit Programme

ROUTINE 2 Company prepares an ENVIRONMENTAL STATEMENT, at the occasion of each audit, for the site considered

ROUTINE 3 The Audit process, and any other process on which the statement is based, and the statement, are VALIDATED by Accredited VERIFIERS

ROUTINE 4 The statement is communicated to the Authorities and kept at the disposal of the PUBLIC

A site may be registered only after the validated statement has been received and the designated competent body is satisfied that the site meets all the conditions of the scheme.

4.2.5.2 Ongoing Requirements

In order to retain registration the company must:

- carry out an environmental audit at a frequency to be determined for each site; the frequency will be based on guidelines to be prepared by the Commission but shall not exceed 3 years,

- examine the findings of the audit at the highest appropriate management level,

- set objectives and measures aimed at continuous improvement of environmental performance,

- prepare the environmental statement; simplified annual statements will be required except in the case of smaller enterprises and sites where there have been few significant changes,

- have the statement, together with any simplified statements, validated by an accredited verifier, and

- following registration, disseminate the validated statement to the public.

Failure to submit the validated statement within 3 months of the due date (as per the previous statement) will result in de-registration.

4.2.5.3 Registration Logo's

Where a site fulfils all the scheme requirements and becomes registered it is then entitled to display the EMAS logo which must be accompanied by an approved statement of the extent of participation in the scheme (see Appendix B). This may be used on stationery, reports and promotional material. The logo may also be used to advertise the company but not to advertise its products or services. Department of Environment (1993) states that this is to avoid confusion with the EC Eco-Labelling Scheme.

4.2.5.4 Administration Details

Each Member State is obliged to establish a competent body to oversee the scheme and an accreditation system for environmental verifiers.

The scheme becomes operational by April 10th 1995, however, States must have the competent bodies and verification systems in place by July 10th 1994. Competent bodies have to compile an annual list of registered sites for publication in the Official Journal of the EC.

4.3 NATIONAL ENVIRONMENTAL MANAGEMENT SYSTEMS STANDARDS

4.3.1 BS 7750

As shown in the introductory section, the British Standard, BS 7750: 1992, was the first such national standard produced. In the introduction to BS 7750 it is stated that the standard complements the EMAS of the EC. Both are voluntary and require companies to have an internal environmental protection system. Both require commitment to a policy of continuous improvement. Both share the same fundamental steps of:

- Adopt policy,
- Initial Review,
- Environmental Management Programme including objectives and targets,
- Environmental Management System,
- Periodic Audits,
- Review of operation in the light of audit findings.

According to Vernon (1992) the key differences between BS 7750 and EMAS include:

– The BS operates company-wide, not just at site level.

- The EMAS scheme is mostly restricted to the scheduled Industrial activities; whereas BS is applicable to all companies.

- BS emphasises internal management systems rather than public disclosure of information.

The similarities between EMAS and National Standards is recognised in Article 12 of the EMAS regulation which allows for EC recognised National Standards to fulfil the Management System requirements of EMAS registration.

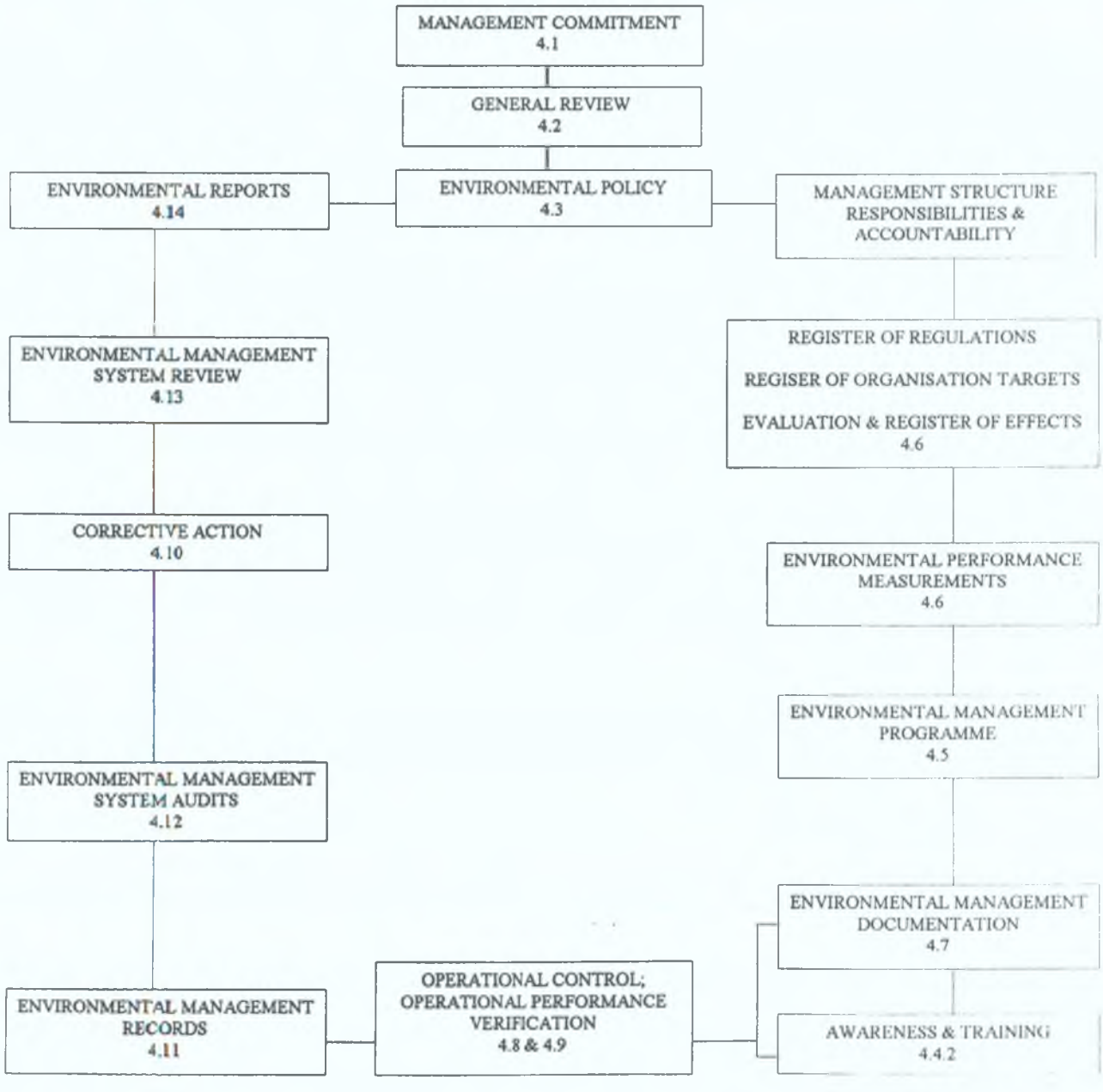
Figure 2: SEQUENCE OF STEPS IN THE DESIGN AND IMPLEMENTATION OF AN ENVIRONMENTAL MANAGEMENT SYSTEM (Source - BHP Training Guide, Autum 1993.)

PART 2 REQUIREMENTS:

Part 2 of IS 310 specifies the minimum requirements for the operation of an environmental management system. Environmental management systems generally comprise the following elements:

- Management role and responsibilities
- Environmental policy
- Planning (design of the environmental programme/ setting performance goals)
- Implementation (environmental procedures/ measurements of environmental performance/internal monitoring and verifying/ corrective action/training)
- Documentation and record-keeping
- Internal and external communications/reporting
- Periodic auditing of the environmental management system
- Periodic review of the environmental management system

Figure 2 shows in expanded form how these various component elements are associated in the process of implementing an environmental management system.



4.3.2 IS 310 (see Figure 2)

An Irish standard for Environmental Management Systems (IS 310: 93) was signed in December 1993, by the Minister for Enterprise and Employment. This Irish Standard is almost identical in content and requirements to the British Standard BS 7750. One significant difference is that the Irish Standard requires companies to produce and make publicly available a report on its environmental performance, based on audit findings. The report is required at least once every three years. This reporting clause means that the requirements of IS 310 are almost identical to those laid down in the EC Eco-Audit Scheme.

The main differences being that:

- Like BS 7750, the Irish Standard is not restricted to scheduled industrial sectors.

- The National Standards are more prescriptive in relation to management performance. One example of this is the requirement for separate registers to be kept in relation to Regulations, Organisational Targets and Environmental Effects.

4.4 WHY HAVE SEPARATE STANDARDS?

Given such inherently similar schemes as these National Standards and the EMAS, why therefore do we need such an array? There appears to be a number of reasons:

- Recognised need in all countries for such schemes.

- Delay in setting up an EC Scheme (work began in 1990, not fully operational until 1995).

- The EC Scheme is limited by having scheduled application sectors. Although encouragement is given to Member States to extend the scope of the scheme, this schedule remains a limiting factor.

- A degree of nationalism where countries still wish to identify with their own standards and if possible set "goals" for others to follow. The British Standards Institute laudably took the initiative in this regard and have been followed by other countries.

- The possibility of the various national standards bodies being aware of moves toward producing an international standard on Eco Management and Auditing. In such circumstances, it would be important for national bodies to be able to put forward their own tested arguments.

- The equally laudable possibility that National Standards bodies are putting themselves in prime position to ensure that they are the appointed administrators of EMA Schemes.

Whatever the reasons, it is obvious that we are still very much in the evolutionary stages of EMA. As such, experimentation is a good thing provided that unnecessary duplication and national interests are not allowed to hinder development towards the ultimate goal of International Standardisation.

4.5 ADVANTAGES AND DISADVANTAGES OF ENVIRONMENTAL MANAGEMENT AND AUDITING

4.5.1 Advantages of EMA

According to Vernon (1992) effective environmental management can turn environmental issues from an area of threat and cost to one of profit and opportunity.

In brief, participating organisations can expect to gain from some if not all of the following:

- Improvements in environmental performance, thus reducing actual environmental damage and strengthening environmental enhancement activities.

- Improved quality in goods and services. In many fields environmental quality is an important, but sometimes over-looked, aspect of overall quality of company operations. Environmental management can be considered for all areas of activity. Goods and services thus gain competitive advantage:

- Financial Savings, from reduction in waste and in consumption of raw materials and energy.

- Improved overall company management by learning improved techniques, e.g. target setting and performance monitoring.

- Assurance of compliance with legislative standards in environmental areas and possibly in areas like health and safety.

- Reduced risk of legal action, bad publicity and fines.

- Outwards evidence to shareholders, authorities, public at large, insurance companies and banks, all of whom are continually looking for increased environmental performance and responsibility from companies.

- Possibility of capturing "niche" markets for environmental friendly products and services.

- Improved performance and awareness throughout the organisation generates pride and confidence.

4.5.2 Disadvantages of EMA:

- Cost. This factor is particularly relevant at the initiation stage. This is when extra set-up costs are involved and no proven or immediate return on these costs can be guaranteed. The cost factor is dealt with in more detail as part of Chapter VI (this study) where the Irish situation is discussed.

- Disruption caused both by the audit/review itself and in implementing changes in response to audit/review findings.

- Uncertainty as to the legal implications of audit findings, particularly if discrepancies in company actions are not acted upon or where action is delayed.

- Danger of wrong interpretation of audit report especially by members of the public

4.6 EXPERIENCE GAINED TO DATE

4.6.1 EMAS Pilot Study

Following the initial publication of the proposed EMAS Regulation on 5th March 1992, the commission initiated a pilot exercise to investigate how the proposed scheme might work in practice.

P.A. Consulting Group carried out the study. The study began in May 1992 and was completed in June 1993. The Group's final report was presented in July 1993.

A summary of the report findings are included in Appendix C.

The sizes of the participating sites ranged from about 30 employees to about 7000. Objectives of the exercise included:

- To see how the Regulation works in practice.
- To investigate how easy it was for companies to comply.
- To identify problems and benefits.
- To provide information on the resources needed.
- To assess the applicability of the general framework to specific Member States, industry sectors and size of company.
- To provide assistance in interpreting and implementing the requirements of the Regulation.

It must be noted that the consulting group were available to facilitate and assist in the activities without imposing a particular interpretation. The situation presented to participating companies was thus similar to practical application situations.

4.6.2 BS 7750 - Application Experiences

The British Standard, BS 7750, has also been piloted by a number of English companies. A summary of findings as reported by The Engineer (1993) are as follows:

- Extreme difficulty in compiling the Register of Legislation and Regulations, stated to be effectively beyond the capacity of most small firms.

- Although the standard calls for staff to be trained it gives no details of the level of competence required. This could lead to subjective judgements and inconsistency.

- For companies; the standard's implementation involves heavy cost burdens. These burdens are prohibitive with small companies particularly disadvantaged.

- There is an ever increasing number of standards in relation to company activities e.g. Quality Management, Health and Safety, Eco Labelling, etc. A more integrated and streamlined system is favoured.

4.6.3 Learning from Experience

The problems identified in the pilot studies can prove useful to all involved in planning, implementing and amending the EM Schemes. Individual companies will be able to identify with particular findings of the studies. However, the biggest challenge posed is for National Authorities trying to implement the schemes. Government Agencies can play a major part to facilitate smooth running of the schemes if they identify and act upon the most relevant problems posed for their particular country.

The Irish situation is the basis for discussion in Chapter VI.

CHAPTER V

CHAPTER V

VERIFICATION, AUDITING AND AUDITOR QUALIFICATIONS

5.0 INTRODUCTION

Chapter IV has shown the broad similarity that exists between EMAS and the National Standard Schemes.

In Chapter V it is therefore proposed to concentrate on EMAS by discussing what appears to be one of the most important aspects of the scheme, namely; the procedure for Verification and Auditing.

The principal aim of this discussion is to highlight the need for a recognised qualification scheme for Auditors and to offer reasoned suggestions as to what is required of such a scheme.

Although Chapter V concentrates on the EMAS scheme, its contents are also applicable to the National Standards schemes in view of the similarities that exist and the common need for auditing and reviews.

5.1.1 Verifier Requirements

Articles 4, 5, 6 and 7 coupled with Annex III of the EMAS stipulate specific requirements and procedures in relation to Environmental Verifiers. The areas covered include:

- Accreditation qualifications and procedure.
- Functions and supervision.
- Conduct.
- Independence.

The requirements are quite comprehensive in scope and in detail.

The following regulation provisions are particularly worthy of note:

- Article 6-5

Members States must inform the Commission of the measures they are taking in relation to the accreditation of verifiers.

- Article 6-6

The Commission shall:

A. Promote collaboration between Member States to avoid inconsistency.

B. Facilitate supervision of verifiers in Member States other than where they have received their accreditation.

- Article 6-7

Allows verifiers to act in Member States other than where they received their accreditation, subject to notification of and being supervised by the other State.

- Article 7

Member States have to keep a list of accredited verifiers and communicate the list to the Commission every 6 months. The Commission shall then publish an overall community list in the Official Journal of the EC.

5.1.2 Verifier Guidelines

The EC together with the UK Department of the Environment have supported research aimed at developing codes of practice for environmental verifiers. The research has resulted in draft guidelines being presented in June 1993. The Draft Verifier Guidelines (1993) contain over 80 pages giving detailed instructions dealing with:

- Verification procedure.

- Documentation and record keeping.

- Interpretation of the scheme.

- Verification contract.

- Guidelines on 'economically viable applications of best available technology' (EVABAT).

- Reporting procedures.

Production of such detailed guidelines is a clear indication of how the role of the verifier is seen to be one means of applying consistent standards throughout the Community. The guidelines also serve to illustrate how extensive and demanding the verifiers role will be.

5.2 VERIFIER/AUDITOR LINKS

There is a very close connection between the roles outlined for the verifier and the auditor. Amongst the verifier functions outlined in Annex III-B of EMAS are:

- Examination of environmental policies, programmes, management systems, review and audit procedures and statements.

- Checking for compliance with EMAS requirements.

- Checking data for reliability and the extent to which all relevant and significant environment issues are included.

- In particular, to thoroughly investigate the technical validity of reviews and audits, without unnecessarily duplicating the procedures of the audit/review.

Avoiding unnecessary duplication would appear to pose a problem. In the absence of recognised auditor qualifications, coupled with a demanding workload, it appears likely that many verifiers will find themselves:

- Wondering what qualifications the Auditor has and having to expend time and effort checking.

- Faced with unsatisfactory audit/review reports.

This scenario could prove very wasteful to verifier, auditor, company and authorities. In certain circumstances, audits and reports would probably have to be completed secondly and then re-checked. Ultimately, it is likely that companies will have to ensure that auditors receive proper training, or that the company withdraw from EMAS.

5.3 AUDITING PROBLEMS

The EC pilot exercise report on EMAS cites the following difficulties that were experienced:

- Difficulty in knowing how to approach specific elements of the Regulation and on the scope and depth required in the review, environmental effects evaluation and public statement.

- Significant input of time resources, expertise and experience.

- The level of detail required for the verification exercise was the cause of considerable uncertainty.

- In relation to performance assessment, there was particular uncertainty as to:

    - levels of performance required by the Regulation.
    - Variability between Member States and industry sectors.
    - How performance should be measured.

- Regarding the Public Statement:

    - How to define and identify the public.
    - Level of detail in statement and how it should be presented in a logical and understandable manner.

- Lack of relevant training.

All of these findings point to difficulties and uncertainties in the area of conducting the audits.

At this point it is appropriate to quote from the introductory section of the EMAS Regulation (Page 3) which states "whereas, in order to ensure an equal implementation of the Scheme throughout the Community, the rules, procedures and essential requirements have to be the same in each Member State".

5.4 EMAS REQUIREMENTS FOR AUDITORS

The EMAS Regulation requires auditors to posses "either individually or collectively the competencies referred to in Annex II Paragraph C and sufficiently independent of the activities they audit to make an objective judgement".

The competencies referred to in Annex II include:

- Appropriate knowledge of the sectors and fields audited.
- Knowledge and experience of the relevant environmental management, technical, environmental and regulatory issues.
- Sufficient training and proficiency in the specific skills of auditing.

Taken logically, a blend of experience, knowledge, training and independence is inferred. Even with such definition the question of suitable qualifications to become an auditor is loose and open to interpretation and debate.

5.5 THE NEED FOR AUDITOR QUALIFICATIONS

Environmental Business Supplement (1991) states that auditing forms a significant percentage of the work of many consultancies but there are few common standards to work to. Baverstock (1993) says that the benchmarks in relation to the knowledge of management systems are well established; the evaluation of relevant environmental expertise is a new aspect of the accreditation process. According to Environmental Business Supplement (1991), American environmental auditing is generally in advance of European practice. In the US, individuals may train and register as professional auditors. A number of universities now offer courses in auditing. At a State level, California has a programme for registering such Environmental Auditors, Nevada has a similar programme. A number of professional recognition programmes have also been

established, leading to designations such as "Certified Env' Auditor" and "Registered Env' Property Assessor".

Smith and Billington (1993) say, that the importance of adequate training cannot be over-emphasised. There is a lag-phase between what industry needs and what educational establishments can provide. For instance, companies can and must respond immediately to changes in environmental legislation but educational establishments cannot necessarily incorporate these changes into their course material at short notice.

The necessity for and importance of standardisation being the foundation of EMAS has already been shown. As the auditing process forms, one of the essential elements of the EMAS it follows that the application of consistent standards in auditing is fundamental to successful implementation of the Regulation. The Draft Verifier Guidelines state that the audit report provides the basis for the verification of other EMAS components. Lack of auditing consistency would be contrary to the reasoning behind the EMAS and would seriously hinder good management standards and practices.

5.6 THE ENVIRONMENTAL AUDITORS REGISTRATION ASSOCIATION (EARA)

Lovelock (1993) says, for companies to be able to select suitably qualified auditors some form of centralised control is required. At this stage only the UK has an auditor control scheme. Bodies in the USA, Australia and Denmark are also working on development of control schemes.

The UK scheme is known as "The Environmental Auditors Registration Association" (EARA). EARA was established in 1992 following widescale consultation with industries, consultancies, professional institutes and other interested parties. EARA is governed by a Council comprising members from the auditing profession, industry, management, academic institutions, environmental organisations and BSI. Broad representation is necessary to ensure that the Council is representative of many areas of environmental concern.

Registration to EARA is at one of three levels:

Associate Environmental Auditor (AEA)
Environmental Auditor
Principal EA

A points system is used for registration. Points are allotted for training, experience, and academic/professional qualifications. The system also involves a combination of references, external verification, peer review and, for higher levels, successful completion of a written or oral examination. Registrants have to attain a minimum number of training/experience points every three years as part of a continuing professional development requirement. Before registration, auditors must first sign, and agree to abide by, a strict code of practice. A disciplinary committee deals with issues of malpractice and may cancel registrations.

According to EARA (1993) it has achieved wide market acceptance in its first year of operation. Over 650 applications for membership were received, many of which were from Europe, USA, Australia and the Far East. EARA now intend to seek certification to the European Standard EN 45013 - general criteria for Certification Bodies operating certification of personnel. EN 45013 registration would provide formal recognition throughout Europe.

As with the British Standards Institute achieving a world first with BS 7750, so also the EARA appear to have introduced an accreditation system for auditors that will provide a model for other countries to copy.

The EARA scheme is quite comprehensive and could provide a good model for an international auditor registration system. However, as is the case with EMAS, the EARA scheme has failed to provide precise guidelines on the key issues of academic/professional qualification and training for auditors.

5.7 STANDARDISING AUDITOR REQUIREMENTS

5.7.1 Introduction

The task of drawing up precise standards for Environmental Auditing is being undertaken by an ISO "Strategic Advisory Group on Environment" (SAGE) - Subgroup. According to ISO (1992), although standards for quality management

systems have been developed, a specific need was felt for a separate guideline for quality audits, including qualification criteria for auditors. ISO further state that their drawing up of such standards provides consensus, consistency and authority, and, CEN could adopt the resulting ISO guidelines as European Standards.

ENDS (1991 and 1992) reported that the European Commissions initial EMAS proposal included a system of auditor registration as follows:

- Codes of practice.
- Performance checks.
- Cancellation of registration for poor practice.

In addition, establishment of an EC Environmental Auditing Committee to ensure a degree of harmonisation in national verification practices was envisaged. ENDS (1992) correctly predicted that these proposals were likely to be opposed. The regulation adopted contains no such requirements.

It can only be presumed that some countries felt it better to develop their own systems. There would also appear to have been a view that the verification system alone could be used to control audit performance. The pilot study findings (outlined earlier) provide justification for the Commissions original registration proposals.

Annex II paragraph C of EMAS sets out the legal framework which has to be satisfied regarding auditor requirements. It is possible to break this framework down into its logical component requirements. These requirements can then be elaborated upon, as per the following sections.

5.7.1.1 "Sufficient training and proficiency in the specific skills of auditing".

This appears to be the lowest common denominator of the requirements. Irrespective of industry type or location, the techniques and methodology of the audit can follow accepted guidelines. ENDS (1992) states that audits would have to take account of ISO standards on audit procedures. Therefore, a compulsory qualification in Environmental Auditing procedures and practices, should be a standard part of auditor training and qualification.

5.7.1.2 "Relevant Environmental Management knowledge and experience".

Again, there are basic management skills in areas of reporting procedures, staff organisation, record keeping and similar issues. These can be adapted for application to most organisations. Auditors will have to posses knowledge of these skills if they are to:

- Understand the management systems.

- Assess strengths and weaknesses of the management systems

as required by the EMAS Regulation.

5.7.1.3 "Regulatory Issues".

According to Cook (1991) a clearly demonstrated awareness and familiarity with both current and future legislation should be shown by auditors. Audits must identify that sites meet both regulatory and environmentally moral requirements. Farrell and Spence (1993) state that awareness of and compliance with environmental legislation is essential for implementation of the Eco-Audit scheme and is in the best interests of shareholders, officers and members of a company.

The legislation aspect of auditing is one that will present some difficulty as regards standardisation. Each Country has its own particular legislative requirements. Even within the EC, complete harmonisation of environmental legislation has not been possible due to such things as different interpretation of Commission Directives and prevailing national interests. In these circumstances it would not be possible for an International or European standard to be applied. It will be necessary for auditors operating in a particular country to be fully aware of environmental and trade related legislation for that country. The legislation aspect of auditor training is therefore more an issue for national administrations to address, with a view to ensuring that their national standards are met. Undue hindrance of non-national auditors being able to meet particular national legislation requirements, must be avoided.

5.7.1.4 "Knowledge of the sectors and fields audited, including technical and environmental issues".

Lovelock (1993), writing about landfill auditing, states that some basic experience in the relevant industrial field is a pre-requisite. This industrial experience could be achieved either by academic or practical experience, or a combination of both. As is the case with legislation, the auditor would be confined to the relevant area of qualification. In this case the restriction would confine the auditor to particular industrial sectors, rather than to particular jurisdictions. This sectoral knowledge could have International status. It is also compatible with the EARA registration scheme.

5.7.2.1 Auditors - A New Profession!

In effect, the introduction of adequate auditor qualifications is not simply a question of giving added responsibility to existing professionals. The auditor job is a complicated mixture. It involves skill in the fields of auditing, management, industrial/ commercial/service applications, legislation and environmental matters. It therefore demands a unique blend of existing qualifications and experience, with the aim of producing a new profession. Given the extremely broad range of industrial and environmental sectors, it would be very difficult for individual auditors to be fully qualified to audit all situations encountered. The answer as far as standardisation is concerned, lies in having a minimum compulsory qualification involving the skills of auditing and management. To these skills must be added stipulated fields of industry and environment which the auditor can work in. The final, but no less important, requirement concerns knowledge of legislation in the Country/ies worked in. Depending on the size and type of company being audited, there will be many instances where more than one auditor will be needed, if all areas of concern are to be covered.

Drafting of precise qualification guidelines will require international input from the various sectors involved. The entire scheme could then be overseen by a professional body similar to the EARA, but, having international application with national branches. Codes of practice and continuing professional development could be applied along similar lines to those in the EARA scheme. It will take many years for such a scheme to become operational. However, in its absence a credible International or European Eco-Management scheme is impossible to achieve.

5.7.2.2 Interim Auditing Arrangements

In the interim, Countries appear well advised to set up national schemes along the lines suggested. The national schemes would serve a number of useful functions:

- Acting as pilot schemes to gain necessary practical experience.
- Having a system in place which could be adjusted to apply an international standard, when introduced.
- Having the concept of EMA established.
- Enabling countries to comment on and influence international debate.
- Providing competitive advantage for goods and services.
- Creating opportunities in education and employment.
- Improving environmental quality and status.

In addition to a system of auditor training/qualification it would appear logical that, until such time as an international auditor registration system can be implemented, Countries should implement their own registration schemes. The justifications for such registration schemes are similar to those listed for auditor training.

CHAPTER VI

CHAPTER VI
THE IRISH SITUATION

6.0 INTRODUCTION

This Chapter focuses on the situation regarding EMA in the Republic of Ireland. The importance of speedy and effective implementation of EMAS is discussed with a view to justifying such implementation.

Chapter VI then concentrates on identifying the challanges and obstacles that face the uptake of EMAS in Ireland and makes suggestions on how these obstacles might be minimised.

As with previous chapters any conclusions relating to EMAS are also relevant to national standards.

6.1 THE PRESENT ENVIRONMENTAL AND INDUSTRIAL SITUATION IN IRELAND

6.1.1. Ireland's Environmental Conditions

According to the Department of the Environment (1992) UN report, by the standard of industrialised countries, Ireland has an exceptionally high quality natural environment. Only 1% of river channel length is seriously polluted, hazardous waste production is small, air pollution is localised and its major problems successfully addressed. In summary, the absence of serious environment contamination is a major advantage in terms of environmental protection in Ireland and one which underpins the vital economic sectors of Agriculture and Tourism. Ireland's food industry and Tourist Board have, over the years, been able to use this "green and natural" image as a positive aspect of foreign marketing strategy.

6.1.2 Ireland's Industrial Situation

The principal components of Ireland's industrial sector are, high technology electronics, pharmaceuticals, chemicals, food and agri-business (Department of Environment '92). Analysis of the list of industrial sectors to which the EMAS can be

applied and the notable absence of significant types and numbers of such industries in Ireland, re-inforces the country's green image.

Long before the Treaty of Rome and at a time when relations between European states were rather volatile, Napolean had occasion to describe England as a "nation of small shopkeepers". In modern times, if the same gentleman were to describe Ireland, the title "a nation of small and medium sized enterprises," might be appropriate. Whilst Ireland has it's share of larger companies and multinationals, the vast majority of its industry is based around SME's. This is illustrated in Appendix D which gives a breakdown of industrial statistics as at March 1994. This predominence of SME's is a significant factor that bears much relevance in dealing with the EMAS situation in Ireland.

6.2 IS EMA RELEVANT TO IRELAND?

6.2.1 Introduction

In view of the foregoing, it would not be surprising if reservations were expressed as to the importance of EMAS in the Irish context.

There are a number of very important considerations which must be highlighted in order to disprove such reservations. These considerations must necessarily highlight areas where action is particularly necessary from Ireland's viewpoint. In addition, many EC partners will be able to identify with some, if not all of these issues.

6.2.1.1 Future Environmental and Industrial Considerations

This appears the easiest issue to highlight. In simple terms it means that what Ireland has it holds. However, there the simplicity ends. A complacent attitude of "resting on our laurels and letting the rest catch up" could easily be adopted. There are a number of reasons why this should not be allowed to happen:

A. Irelands environmental status would become greatly diminished in comparison with other countries. This would reduce the attractiveness of its green image and undoubtably have negative effects in trade terms.

B. There are many areas of environmental concern in Ireland where improvement is needed. According to the Irish Government's National Plan (1994) there are significant local impacts from a range of economic activities and waste disposal practices. Quality trends have not been uniformly positive. The natural environment has shown deterioration in some key areas, for example, decline in lake water quality, increase in ground water contamination and loss of natural hatitats. Department of Environment (1992) states that recycling offers scope for productive economic activity and employment, however the proportion of waste re-cycling in Ireland is low.

C. National pride and a willingness to preserve and protect amenity and health should dictate that Ireland reduces all forms of pollution, to the greatest extent possible. Given that the objectives set out in EMAS are "to reduce and as far as possible eliminate pollution", also "to promote continuous improvements in environmental performance", the scheme should be particularly appropriate in Ireland. The National Plan (1994) says that there is an increased and widely based concern for the environment in Ireland. This concern reflects the intrinsic value of an unpolluted natural environment.

6.2.1.2 International Citizenship

Primarily, as members of the EC, Ireland has a duty to strive towards successful implementation of Community policy and legislation. Given that Irelands structural fund allocation per capita is the highest in the community, the obligations seem greater.

Department of Environment (1992) states that Ireland is very conscious of its international responsibility and is party to some thirty international agreements on environmental protection. The report further states that while the use of CFC's and halons in Ireland is small (approximately 2,500 tonnes per annum), measures to reduce consumption are important. In addition, any efforts that Ireland can make on reducing/saving energy and raw materials adds to the global efforts.

6.2.1.3 Economic Opportunities

This issue is distinct from maintaining existing trade advantages. It is an area where Ireland can benefit greatly, and must be quick to capitalise on. For this reason it is an issue worth dwelling upon.

According to Converey (1993), at a time when every possible employment option is being assessed, it is hardly conceivable that Ireland is virtually ignoring what is probably one of its outstanding competitive advantages - its environmental quality and image. It is even more difficult to understand the lack of any substantive policy or initiatives to help in capturing a share of Europes biggest and most dynamically expanding industrial sector: environmental products and services.

Shrivistava (1992) says that the proliferation of environmental friendly programmes represents significant costs. The long term viability of programmes depends on them providing concrete competitive and profitability pay-off. Thus, programmes are screened on cost effectiveness and competitive advantage.

Companies need to reassess their corporate portfolio of products and business. Markets for environmental friendly products, cleaner technologies and pollution control systems are expanding rapidly. Companies can exploit this emerging opportunity, simultaneously it would be wise to phase out polluting/harmful products and eliminate hazardous technologies from the corporate portfolio.

Wilkes (1992) states that every piece of EC environmental legislation impacts on existing technologies and products. There are great opportunities as well as threats. Environmental protection expenditure is a "zero-sum game", with the cost to one sector being a gain for the abatement sector. Major new markets beckon for companies whose products and activities meet the demands of future environmental legislation. The new "green markets" are estimated to be £140 billion in the UK, £850 billion in the EC and £1,000 billion in the USA, up to the year 2000 (DOE England, Press Release May 7th '92). Germany is the largest manufacturer in the world of environmental protection technology with 21% of the market. Second comes the US with 16%, then Japan with 13% (German Ministry of Research and Technology April '92).

In relation to UK performance the Secretary of State for Trade and Industry, Michael Heseltine, told the 1991 CBI Conference that the ratio of exports to imports of clean technology in Britain had fallen from 8:1 down to 1:1.

An EC report on Industry and the Environment (1991) highlights the benefits for innovative companies with recognised low-pollutive equipment and know-how. These companies are in a position to sell their expertise to rivals striving to match standards. A Department of Environment (Ireland) Report (1993) states that if cleaner industry is

promoted in Ireland, there is scope for the growth of an environmental products and services sub-sector, initially to satisfy home market needs but ultimately has export potential. The National Plan (1994) re-inforces this opinion.

There appears to be a broad consensus in relation to the commercial potential for innovative low-pollution technology and know how, both of which are interlinked. The most effective ways of exploiting this market rely on:

A. Adequate research and development into such technology and know-how.

B. Application of these innovations to industry (preferably home based). This can have the dual effect of demonstrating efficiency and establishing a reputation for quality and ability. At the same time it greatly benefits environmental quality at home.

6.3 CONCLUSIONS ON RELEVANCE OF EMAS IN IRELAND

The EMAS with its central themes of:

- Environmental protection and sustainability,
- Pro-Active approach,
- Continuous improvement,

provides the most comprehensive policy basis for companies wishing to develop their potential, covering, as it does, such a broad range of company activities. However, the "early-starter" approach is vital.

Ireland therefore does not only stand to gain from rigorous implementation of EMAS, failure to apply it seriously will have long-term detremental consequences for business.

6.4 ESTABLISHING COMMITMENT

The problem of commitment is one that all countries will have to face.

Commitment forms the basis of any initiative. In the case of EMAS, such commitment is not only desirable for reasons of progress but, as has been shown earlier, is probably unavoidable for reasons of business survival.

To promote the concept of environmental auditing the Chambers of Commerce of Ireland (CCI) have produced a booklet titled "Guide to Environmental Self Auditing" (1993). In the introductory section of the booklet Mr John Browne, Minister of State for Environmental Protection, and Chamber President, Mr Pat Loughney, both endorse and encourage the auditing theme. As such, both Trade and Government are commiting themselves to the value of EA. Similar approval has come from bodies such as FICI, ESB, International Labour Office, World Resources Institute, and many more.

In view of such widespread promotion of the management and auditing theme, coupled with the stated benefits of participation, it is unlikely that lack of commitment will be one of the major problems to be faced.

6.5 DECIDING HOW TO APPROACH THE OBSTACLES IRELAND FACES

6.5.1 Introduction

Having established the relevance of EMAS to Irish application the next issue is that of assessing the readiness and likely needs that exist. By so doing it is possible to keep implementation problems to a minimum, especially in the early stages. It also helps in identifying where assistance is most needed.

6.5.2 Useful Research Data

Very little research data are available in relation to the application of EMAS specifically to the Irish situation. It therefore seems logical to approach the issue by seeing if there is any existing research information that may be of relevance.

6.5.2.1 Cleaner Manufacturing Technology Report

As recently as 1993 a report has been published on the promotion and uptake of Cleaner Manufacturing Technology (CMT) in Ireland (The Irish Study). The assignment was commissioned by the Department of Environment and carried out by the PA Consulting Group.

The primary objectives of the assignment were to identify:

- which CMT's are most applicable for rapid uptake by Irish industry,
- what major obstactles exist to the take up of these CMT's, and measures that can be taken to accelerate uptake,
- how a programme of activity should be organised and controlled to promote the uptake of CMT's.

The assignment involved a survey of 20 senior managers and directors from a range of industrial sectors. Representatives of agencies/departments responsible for industrial development were also interviewed. In addition, the Consultants reviewed various European initiatives and drew on their own previous experience and knowledge, to strengthen the reports findings.

The concepts of EMA and of CMT are inseperable. The report defines CMT as:

"those technologies which use raw materials and energy more effectively, produce less waste and thereby cause less pollution than traditional technologies - therefore they have less environmental impact".

The principles of:

- using materials and energy more effectively,
- producing less waste,
- causing less pollution,
- having less environmental impact,

are shared by both concepts. The report recognises this saying:

> "it is also important to recognise that there are opportunities to reduce waste and effluent from existing processes by the application of Good Environmental Management Practices".

Of even more relevance is the recommendation contained in the CMT report that CMT's should be promoted within a wider agenda which includes the promotion of good Environmental Management practices.

It must also be noted that both concepts are relatively new and unproven, are being introduced concurrently and result in considerable implementation costs, even though the long-term implications are financially beneficial.

Any differences of principle between the EMAS and CMT are minor. The EMAS initiative is more wide ranging in its application to companies. It could be argued that CMT, like auditing, is a necessary and vital tool of a good environmental management system and therefore forms part of the system. It can also be concluded that where such a close relationship exists the findings of the survey in relation to CMT can be carefully assessed for relevant application to EMAS.

6.5.2.2 The Danish Environmental Auditing Report

Looking abroad, Christensen and Nielsen (1993) have researched the environmental auditing situation in Denmark (The Danish Study). Significantly, their study covered Environmental Audits and Clean Technologies within the same brief. Their findings appear relevant given the following extracts from their report that co-relate to the Irish situation:

- the majority of Danish companies are SME's,
- the previous attitude to environmental protection in Denmark was confined to meeting regulatory requirements,
- Denmark has recently introduced a new Environmental Protection Act based on the promotion of cleaner industrial action,
- companies are responding to the international "green" agenda,
- the reports conclusions should help place the role of EC regulations on environmental auditing into perspective.

It appears reasonable to assume that there will be many similarities between the Danish and Irish situations.

6.5.3 Discussion of the Obstacles to Uptake of EMA in Ireland

6.5.3.1 Introduction

In discussing the obstacles Ireland faces it is intended to concentrate on the findings of the Irish and Danish studies in an attempt at identifying the relevant implementation problems likely to face Ireland and to make appropriate comments regarding these problems.

The Irish study found that most companies are aware that their processes may effect the environment, however, virtually none of the Senior Managers spoken to were familiar with the concept of CMT. The reasons identified for this are that end-of-pipe approaches to pollution control have dominated thinking, they usually have a proven cost/benefit case and are widely available. End-of-pipe approaches are often the most effective answer to existing legislation that is fact acting and tough. The Irish study found that six important barriers to the uptake of CMT existed, namely:

- Awareness.
- Technology Transfer.
- Cost Benefit justification.
- External constraints.
- Perceived Risk.
- Investment Capital.

The question of Technology Transfer is mainly a CMT issue, therefore the five remaining headings are of most relevance for EMA purposes.

6.5.3.2 Awareness

On average, companies with a multi-national parent have a greater awareness of cleaner options.

Within indigenous companies, those with a history of having to deal with environmental issues tend to be more aware than sectors such as animal-by-products or metal finishing where environmental issues have only recently come on the agenda.

To date, the emphasis on awareness building has been chiefly directed towards technical and engineering staff.

The Danish study reports that companies had a very loosely structured organisation and an incomplete knowledge of environmental conditons. Environmental knowledge and concern was generally aimed at satisfying legislative requirements. The preconditions for adequate environmental knowledge must therefore be developed.

6.5.3.3 Cost/Benefit Justification and Perceived Risks

In general there are two principal reasons why companies install new systems:

- In response to legislative requirements.
- Proven cost effectiveness of the new system.

For EMAS there is no direct legislative pressure, therefore the issues of cost/benefit and of inherent financial risks are the main areas where persuasion is required. With innovative approaches, such as EMAS, this persuasion is more difficult.

The Irish study reported that companies find it costly to actually investigate and assess new systems, this is often a deterring factor especially in times of financial recession when resources are scarce. Irish companies suggested that they would need to see a pilot site or demonstration project before they would consider commiting resources. It was felt that the impact would be greater and easier to assess if these demonstration/pilot projects were located in Ireland and in a similar sized company and sector to the target companies.

Once again, companies with a multinational base had the advantage in being able to apply systems that had been tried and proven by a foreign sister-company.

The Irish study reported that experience in other European countries had shown that demonstration resources can be wasted without an effective follow-up.

According to the Danish study, information activities and projects needed to be supplemented by definite implementation activities such as the Danish EPA becoming concerned with assessing environmental audit methods and commencing various industrial consultancy schemes. The reason why environmental auditing became popular in Denmark was related to pilot auditing schemes having been set up in Holland and Sweden. Danish companies identified with these pilot schemes and began to accept the initiative.

6.5.3.4 External Constraints

The Irish study found that within certain sectors, processes must be validated. Pharmaceutical processes must be FDA approved, metal finishing procedures for aero-engine parts must be accepted by the relevant aviation authority. Process or material change would warrant re-validation, which is time consuming and costly. This hinders change and favours an "end-of-pipe" approach which can simply be added on to an installation.

Thankfully, the majority of industries will not be hindered by external constraints. Such constraints should not prove a significant factor in the overall workings of the scheme. External influences look likely to be mainly consumer related and pro EMAS.

6.5.3.5 Investment Capital/Cost

Capital in relation to CMT equates with overall cost in relation to EMAS.

Irrespective of factors such as outlined in relation to commitment, awareness, cost benefit and perceived risk, the entire concept comes down to companies having to invest money in new systems.

6.5.3.5.1 Initial Costs Are Crucial

It is impossible to quantify exactly how much initial participation in the EMAS scheme will cost individual companies. This is because of divergences in size, management systems, existing plant and other factors. What has been shown is that the long-term effects of EMAS should be financially beneficial. As far as financial matters are concerned, the most crucial stage for companies implementing EMAS is therefore likely to be when first participating. This is because there is going to be a "lag-phase" between implementing the scheme and consequent feed back of cost benefits.

6.5.3.5.2 Cost and Company Size

For larger companies the financial issues can be borne more easily. Such companies usually have some kind of existing environmental management system. In addition, larger companies benefit from the recognised "economies of scale" factor. Smaller companies, with less expertise and finance readily available, will be at a particular disadvantage. Not only has this fact emerged from the EC pilot study on EMAS, it

was also envisaged by the EC when drawing up the EMA scheme. Article 13 of the EMAS makes special provision for Member States and the Commission itself to:

- Promote assistance with expertise and support.
- Present appropriate proposals to the European Council aimed at encouraging participation by SME's.

The special position of SME's is also recognised in the EC policy document, Towards Sustainability (1992). Given the pre-dominance of SME's in Irish industry it can be inferred that special provisions will have to be made for such industries.

Having noted that the Danish industrial structure is predominated by SME's, the Danish study reported that almost all companies studied indicated that without public support and subsidy they do not consider that they would have undertaken audits. The Danish study concluded that environmental auditing in Denmark depends on economic subsidy and technical assistance. Also, that efforts at gaining support for auditing should be directed more towards industrial sectors, rather than individual SME's. The Irish study found that many of the sectors with most environmental problems were those least able to afford alternatives. This was particularly true for some smaller companies.

By relating the predominance of SME's in Irish industry to the problems associated with such companies undertaking EMA, it can be appreciated that the EMAS will prove particularly difficult for Irish implementation. Equally, it is recognised that the only way to overcome the problems for SME's is by provision of financial and technical help. This recognition comes from EC, Government, Auditors, Academics and Industry. Article 13 of EMAS gives the clearest indication of where assistance for SME's should come from - "Member States". In the Irish context this points to assistance from the Irish Government.

6.5.3.5.3 A Role For Government Assistance Measures

According to Clement (1993), economic policy instruments have an important role to play as a complement to direct regulation. In 1993 an OECD workshop assessed whether and how Government assistance could stimulate cleaner industrial performance. The workshop (OECD 1993) concluded that Government financial assistance has played a positive role in promoting and stimulating research,

development and CMT. Programmes and funding have increased over the past three years, using grants or loans.

Clement (1993) also outlines the findings of three EC surveys on State Aid to industry for environmental protection. The findings are summarised as follows:

Table 1 identifies the percentage of expenditure on the environment in Member States from the total aid given to the manufacturing sector, 1981-1990. The figures show that Ireland, along with Greece, Belgium, Italy and Portugal, has given low priority to environmental expenditure.

Table 2 re-inforces these findings

Table 3 is the biggest indictment of all for Irish Government Policy on promoting environmental incentives for industry - Ireland is the only country with no incentives. The 1993 CMT report states that the Irish Industrial Development Authority is primarily concerned with employment creation and industrial growth and has no programme to promote cleaner technologies. Neither is there any assistance available for promoting EMA.

Table 1: State Aid to the Manufacturing Sector
Percentage of Aid on Environment

	1981-1986	1986-1988	1988-1990
Belgium	-	-	-
Denmark	1	4	4
Germany	-	1	2
Spain	-	-	1
Greece	-	-	-
France	-	1	-
Ireland	-	-	-
Italy	-	-	-
Luxembourg	-	-	1
Netherlands	3	2	2
Poland	-	-	-
United Kingdom	-	1	2

Source: CEC,1992

Table 2: Environmental Expenditure
(ECU millions)

	1981-1986	1986-1988	1988-1990
Belgium	-	-	-
Denmark	7	8	14
Germany	92	103	162
Spain	-	6	16
Greece	-	-	0.5
France	6	27	28
Ireland	-	-	-
Italy	-	-	-
Luxembourg	-	-	0.5
Netherlands	27	17	30
Poland	-	-	-
United Kingdom	-	16	64

Source: CEC,1992

Table 3: Environmental Incentives for Industry in EC

Belgium	1
Denmark	3
Germany	15
Spain	1
Greece	1
France	9
Ireland	0
Italy	1
Luxembourg	1
Netherlands	5
Poland	2
United Kingdom	2
EC: 12	41

Source: EPRC, 1993

For Ireland, the combination of having a predominance of SME's without any State support for environmental protection measures, is probably the biggest obstacle to effective implementation of EMAS.

Part of the CMT report involved a review of European "Cleaner Production" initiatives. Amongst the significant findings were:

- Most countries have developed activities specific to cleaner technology and production within general environmental themes and have recognised the barriers to their uptake, as well as the benefits they produce.

- A mix of private sector and public sector programmes exist within a range of measures such as:
  - Demonstration projects and supporting literature detailing advantages/disadvantages, cost/benefit analysis etc.
  - Free consultancy to conduct 2 or 3 day reviews to identify cleaner options, in addition to free telephone enquiry points.
  - Conferences and training workshops.
  - Awards to raise the profile of cleaner approaches.

- Financial subsidies and incentives in the form of:
  - Grants.
  - Loans which facilitate repayment from savings made and finance generated by cleaner processes.

The study noted that many of the initiatives were recent in origin.

According to Clement (1993) approximately 70 percent of environmental incentives in EC States are offered as grants, "soft loans" (subsidised interest rates) account for 25% of incentives, the remaining 5% is in the form of depreciation allowances. Governments are increasingly recognising that economic instruments can play a significant role in environmental policy. Comparative surveys have shown that Government expenditure on environmental aid is constantly increasing. Experience with these initiatives can be expected to lead to the development of frameworks and models which best promote sustainable development.

6.5.3.5.4 The Northern Ireland Environment Audit Support Scheme

In Europe, one of the most positive initiatives to support the implementation of EMAS has been introduced in Northern Ireland. The "Environmental Audit Support Scheme" was introduced in 1994 and is being administered by the Industrial Research and Technology unit.

The EA Support Scheme offers 66.6% grants towards the cost of up to 15 consultancy man days and reasonable expenses, to industrial and commercial concerns for the employment of independent consultants to identify the potential for improvement in environmental performance. The maximum grant available for any one audit is £5,000. With the exception of Government Departments, Local Authorities and Statutory Bodies, the scheme applies to all commercial companies and organisations in Northern Ireland, irrespective of size or sector.

From the Irish Republic's viewpoint the fact that this type of Audit Support Scheme exists in Northern Ireland is significant for a number of reasons:

- Similar types of industrial bases.

- Significant competition between the two areas both from a marketing viewpoint and for attracting foreign industry.

- Sizeable trading links between the two areas.

- The concept of cross-border co-operation that has been strongly promoted in recent years under such schemes as INTERREG and the Cross-Border Fund.

- A common and interlinked environment.

6.5.3.6 Conclusions on Cost

It can be concluded that the cost factor in relation to environmental protection measures by industry is one that has been recognised and acted upon throughout Europe. Irish Government policy appears to be seriously deficient as regard providing assistance for environmental protection.

A number of incentive options exist, including subsidised loans, grants, tax incentives, etc. Failure to provide such incentives in Ireland leaves Irish companies at a serious disadvantage in relation to the uptake of EMAS.

6.5.4 The Importance of EMAS Being Recognised as a Business Aspect

Being a recent initiative the EMAS concept faces difficulty as regards which aspect of business it can best be included in. It does not come into the area of capital expenditure, such as CMT generally does. It is in fact applicable across a range of business areas including management, education and training, pollution control, public relations and research development (R & D). The difficulty faced by EMAS is that traditional budgeting and grant/assistance measures have been geared towards definite areas of business.

Until firmly established and accepted as a necessary area of business it would be beneficial for the EMAS concept to be included in one of the traditional business aspects. While it ultimately appears best suited to a management function, it also involves "Research" into existing company practices and "Development" of improved practices. This R & D function is particularly relevant to existing companies in the initial stages of EMAS implementation.

Nationally, EMAS forms part of the "Development" of a sustainable policy for growth. Article 72 of the Environmental Protection Act, 1992, allows the EP Agency to:

- Prepare and publish guidelines on EA - (research function).
- Provide assistance and support for the purposes of developing EA's.

From the point of view of State assistance, the EMAS should, at the current "initiation" stage, be looked upon as environmental R & D. At a later stage it will, hopefully, merit a business category of its own.

Addressing an Irish Management Institute conference (1994), An Taoiseach, Mr Reynolds, acknowledged that scientific research and development had a vital role to play if Ireland were "not to fly on other peoples coat tails". Mr Reynolds also said that such R & D had been sadly neglected by Government in the past and was deserving of more support.

The next step is to ensure that the EMA initiative is seen as a vital part of R & D into future economic/industrial policy. As such it merits adequate funding.

6.5.5 Worker Participation

The final area for consideration in relation to the uptake of EMAS in Ireland is that of worker participation. This aspect was not covered in the CMT report.

The EMAS regulation makes specific mention of worker participation, stating:

- The application of EM systems by companies shall take account of the need to ensure awareness and training of workers in the establishment and implementation of such systems.

It must also be borne in mind that the EMAS will influence very many aspects of workers lives including Health and Safety, career structures and job security, industrial relations and job satisfaction, external environment, etc. In addition, as one of the Social Partners our Trade Union movement have for many years played a vital part in development and planning policies for the country.

It would therefore be vital to facilitate and encourage worker participation. In the National context the only realistic and workable way of doing this is by ensuring that the Trade Union movement are adequately consulted when a definite strategy is being drawn up on EMAS.

6.6 DEVELOPING AN OVERALL STRATEGY FOR THE UPTAKE OF EMA INITIATIVES IN IRELAND

6.6.1 Introduction

In the development of a strategy for the uptake of EMAS the most important consideration is that of addressing the possible obstacles which have been identified earlier. By drawing together the relevant action on these obstacles it is possible to produce an overall strategy for uptake of EMAS.

Whilst such strategy would have to be developed and expanded upon during implementation, it does provide a solid framework upon which to build.

6.6.1.1 Awareness

The first issue to address is that of awareness.

Both the Irish and Danish studies are agreed that it is important to target the SME's in particular, with special emphasis on indigenous companies. Both studies also agree that the best way of doing this is on a sectoral basis, using trade groups or associations to the fullest extent possible. This points to the need for joint action by Government and Industry, especially as the EMAS concept is mutually beneficial. As with any "courtship" situation the biggest question will probably concern who makes the first move? Once again the EMAS regulation performs an arbitrary function where Article 15 states that each Member State shall ensure, by appropriate means, that companies are informed of the content of the regulation.

The initial approach should therefore involve targeting the various trade groups/associations, as well as the Trade Union movement. This could be done using a general strategy of awareness raising that is applicable to all sectors concerned. It should involve a promotional campaign aimed at:

- Outlining the development and operation of the EMAS scheme; as a means of displaying the relevance and context of the scheme.

- Providing information on advantages/disadvantages; in order to promote acceptability.

- Putting in context the situation regarding participation in the scheme and the implications for future trade and employment.

The next stage of awareness raising should involve co-operation of administrative bodies and the various sectoral groups, in an effort at promoting the scheme to individual companies.

Experience from the Irish study suggests that this promotion should not be aimed solely at engineering/technical staff but must give equal emphasis to reaching managers and directors. Some participation by the Irish Management Institute and Accountancy Associations is suggested.

Each sectoral group could draw on existing knowledge of business concerns in their particular sector, and integrate these concerns into an information programme that is relevant to everyday company operation.

Demonstration projects and pilot schemes, running concurrently with the awareness campaign, would not only heighten awareness but would also serve to strengthen commitment and provide some indication of cost/benefit factors. These projects would, in addition, help in developing "model" systems applicable to each sector and would prove beneficial for long-term application of EMAS. In view of the many advantages these demonstration/pilot projects would provide, it seems appropriate that any necessary technical or expert help required should, subject to appropriate conditions, be provided free of charge.

The Irish study suggested that, because of the number of companies within the Food and Dairy Sector and the Timber Processing Sector, these sectors would seem ideal starting points.

The demonstration projects could also serve as a nucleus for the running of conferences/seminars and the provision of follow-up information on EMAS. Project results could be disseminated and cross-sectoral exchange of experiences and ideas could be promoted as a further means of problem solving.

6.6.2 Company/Sectoral Standards

As the purpose of EMAS tends towards companies bringing their performance up to the best possible standards, there is an outstanding need for readily available information and guidance on concepts such as BAT and BATNEEC for individual sectors.

In this regard the range of knowledge within the sectoral groups can be utilised. However, there is a definite role for the Environmental Protection Agency to play. Not only is such role provided for in Section 74 of the EPA Act, it is also in keeping with the Agency's overall functions in relation to:

- Best Available Technology for industrial licensing and development.
- Integrated Pollution Control.
- Environmental Research and Data.
- General Pollution Control.

Production of these sectoral guidance notes is therefore one of the issues requiring early attention. Such guidance notes can also help in the area of promoting CMT concepts and in illustrating how improved management practices can often reduce the need for investment in end-of-pipe technology.

6.6.3 Awards Schemes

One of the European initiatives mentioned in the Irish CMT study is that of having an awards scheme to raise the profile of cleaner approaches.

This type of initiative can often be implemented using the help of sponsorship. With good media coverage the promotion of an appropriate awards scheme should prove a very effective and low-cost way of heightening interest in the EMAS principle. Given that the ESB has committed itself to;

- the principle of EMA,
- encouraging suppliers to do likewise,

- the principles of environmental protection and energy conservation,

sponsorship by such body would re-inforce their principles and illustrate to all companies that ultimately, larger companies such as ESB, are likely to demand EMAS participation by their suppliers. This point also illustrates the influence that large consumer bodies, like public authorities, can have in relation to supplier performance. There is scope for the Government to adopt a policy regarding public authority purchasing and expenditure that gives due recognition and reward to companies participating in schemes such as EMAS. Early promotion of this type of policy would greatly help in the uptake of EMAS.

6.6.4 Public Disclosure

CMT does not involve any requirements on disclosure of information to the public, therefore the disclosure issue has not been identified in the Irish CMT study.

Reluctance to disclose information to the public is likely to be another significant obstacle hindering participation in EMAS, especially in the earlier years of the scheme. It is important that any programme of awareness building highlights the following:

- The existence, and requirements, of legislation on freedom of access to environmental information.

- How to present information to the public and the benefits that accrue from an "open" approach.

- That EMAS participation will often forestall the need for action against companies for non-compliance with legislation and that such legal action inevitably leads to the type of bad publicity that is more damaging than self-disclosed information. In addition, if company performance is sufficiently poor to warrant public displeasure, it is also likely to warrant legislative action, on environmental grounds.

6.6.5 Government Funding

Regarding capital/initial expenditure on EMAS participation, it is vital that some type of Government grant/loan system be introduced to assist participation in the scheme. Such type of environmental protection initiatives are not unknown under different

guises, such as, the preferential taxation treatment of unleaded petrol and LPG, the significant difference being that expenditure on EMAS subsidisation would have positive trading and employment consequences for Irish industry.

The Government should seriously consider introduction of a scheme similar to the "Environmental Audit Support Scheme" operated in Northern Ireland. In doing so it should be borne in mind that a support scheme will probably only be necessary until such time as the EMAS principles became routinely accepted/demanded.

Finally, it would save both Government and Industry quite an amount of otherwise "double-effort" if the concept of EMA and that of CMT were jointly promoted. Such joint promotion would in itself be a prime example of good management practice!

CHAPTER VII

CHAPTER VII

CONCLUSIONS AND FURTHER RECOMMENDATIONS

7.0 INTRODUCTION

The major recommendations of this thesis are centred around:

A. The need for a proper Environmental Auditor qualification and registration system.

B. The situation as regards relevance, promotion and uptake of EMA in Ireland.

As such, the recommendations concerned are included in Chapters V and VI, which deal with the respective issues.

This chapter will therefore concentrate on conclusions and recommendations of a more general nature, relating to the EMA concept.

7.1.1 Widespread Advantages of EMA

The principle of EMA is unique in that its long-term implementation not only provides environmental advantages but should also be financially attractive to both legislators and implementing companies. Legislators will benefit from reduction in the work load involved in pollution monitoring and control, due mainly to the self regulatory nature of EMA. Companies will benefit from reduced production costs and better marketing opportunities. The general public also stand to benefit from improved environmental quality and better consumer information. Of all the initiatives in environmental legislation currently being promoted, the EMA concept should therefore prove to be the most attractive.

7.1.2 A Long-Term Rather Than Short-Term Concept

What must be stressed is the "long-term" aspect of EMA benefits and the consequent need to overcome short-term obstacles and reservations. Primarily, this can be done by raising awareness amongst legislation enforcers and the business community. Once in everyday practice the EMA concept should then have a type of self-sustaining effect in extending its appeal.

7.2 IN KEEPING WITH CURRENT ENVIRONMENTAL LEGISLATION TRENDS

Along with its stated advantages, the EMA concept also concurs with the necessary trend of environmental legislation towards the principles of:

- Sustainable development.
- Disclosure of information to the public.
- A self-regulatory approach by industry that places emphasis on continuous environmental improvement.
- Promotion of concepts such as BATNEEC, BPEO and integrated pollution control.

EMA also operates alongside other initiatives such as:

- Management quality standards.
- Product quality standards.
- Eco-labelling.
- Freedom of information legislation.
- Hygiene legislation.
- Health and Safety legislation.
- Cleaner Manufacturing Technology.

7.2.1 The Need for Rationalisation and Integration

The fact that all of the above initiatives share similar themes is a considerable advantage.

One disadvantage of this range of initiatives is that of an ever increasing array of legislation based and quality control instruments. The sheer number of such instruments is putting considerable pressure on business and authorities.

Regarding EMA, the similarity that exists between the individual schemes is indicative of consensus. This consensus will eventually lead to the development of a single recognised standard. Such an EMA standard will most likely be drawn up by the International Standards Organisation and will be able to benefit from the experience gained in implementing the present schemes.

Even with such an International Standard there is a need for further rationalisation. This would see initiatives such as EMA standards, general company management standards, product standards, labelling standards, hygiene standards and, to an extent, health and safety standards, being integrated to yield an "Overall Quality Management" scheme for companies. Although such an overall scheme would be demanding on available skill, it would simplify both the interpretation and administration needed. It would also prevent companies from focusing on one aspect of their business, at the expense of another aspect.

7.2.2 Proliferation of Logo's

Another factor to consider is that of an increasing number of "logo's" that go with these schemes. The principle of a recognisable logo is basically sound, both for business and consumer. The proliferation of logos is confusing.

A company resourceful enough to qualify for a number of such logos could find itself wondering about its position regarding packaging and waste legislation, if it is to display all of its applicable logos.

For the consumer such an array of logos must also create confusion and diminish the relevant value of the logos.

7.2.3 Business Pressure for Rationalisation

Moves towards this integration of standards is most likely to come from the business sector who face the greatest pressure from legislators, consumers, environmentalists and peer companies.

7.3 STILL AN EVOLVING CONCEPT

Taking an overall look at the present position regarding EMA, it is apparent that the concept is still very much undergoing an evolutionary process. As with any such process it is hard to predict exactly what comes next.

Participation in all of the existing EMA schemes is on a voluntary basis. There appears no doubt that the future will see an evolution to compulsory status, probably starting with larger more environmentally detrimental industries.

Extension of the scope of these schemes to become an accepted requirement in the service and public authority sectors is also inevitable.

7.4 AUDITOR QUALIFICATION

The experience so far gained from implementation of the EMA concept, and especially from the EC's EMA scheme, indicates that, despite the trend to consistency and standardisation, the question of auditor qualification remains loose and open to interpretation.

Auditor functions are fundamental to the success of the EMA concept, forming the basis for the overall management strategy of a company and providing essential information for the verification and public information requirements.

Chapter V of this study provides reasoned argument for a proper auditor qualification scheme and outlines the essential requirements of such a scheme.

For the EMA concept to become a relevant standard, it is vital that immediate attention be given to drawing up a proper Auditor Qualification and Registration Scheme, along the lines suggested.

7.5 THE IRISH POSITION

Ireland enjoys relatively good environmental quality and does not have either the density or scale of environmentally threatening industries that many countries have. There is therefore a danger that the EMA concept might be looked upon as having little relevance to the Irish situation. However, such is not the case and Ireland has as much to gain by proper implementation of EMA schemes as does any other country. Apart from environmental factors there are definite trade and employment consequences in the implementation of EMA.

Chapter VI details the reasons why the EMA concept is so important to Ireland. Chapter VI also identifies the major obstacles to the uptake of EMA by Irish industry and makes recommendations for the adoption of a strategy to promote uptake.

Perhaps the biggest danger facing Ireland is that of regarding the EMA concept as solely an environmental protection measure. It must be recognised that EMA has implications in the additional fields of employment, foreign trade, education and international status. To gain optimum advantage in these areas it is vital to adopt the "early riser" approach. Failure to do so allows other countries to gain the advantage both in Ireland and abroad.

The greatest difficulty facing Ireland as regards the early uptake of EMA lies in the fact that the industrial base has a predominance of small and medium sized enterprises (SME's). There is widespread acceptance that the cost of implementing the EMA concept is particularly prohibitive for SME's. Compounding this problem is the additional fact that Ireland is the only country in the EC that does not have any state subsidised scheme for environmental protection measures. Regarding EMA, the Northern Ireland Authorities have introduced an Environmental Audit Support Scheme which offers a grant of 66.6% to all commercial organisations undertaking an environmental audit, using consultants. In addition, the EMAS regulation encourages Member States to assist SME's in implementing the scheme.

The Irish Government can therefore do more than anyone else to assist in the uptake of the EMA concept. There is justifiable reason for the introduction of a state-sponsored scheme, similar to the Northern Ireland scheme. Any short-term financial outlay on such a scheme will be more than off-set by its long-term benefits.

There is also scope for the adoption by State Bodies of suitable EMA schemes. State Bodies should also promote a purchasing policy which recognises the efforts of companies that adopt an EMA scheme.

Trade Groups and sectoral organisations must also recognise the importance of EMA. Such groups should actively promote the concept within their own individuals sectors. Co-operation between individual trade groups, authorities and trade unions, is also an essential requirement for effective EMA uptake.

7.6. EMA - A NUCLEUS FOR FUTURE ENVIRONMENTAL PROTECTION POLICY

The EMA concept alone is not going to miraculously solve all of the environmental problems that exist. It does however, exert an extremely broad range of control over company environmental performance. In so doing it provides a nucleus for compliance with all other aspects of environmental legislation that applies to a company, and has a major role to play in changing the previous re-active approach to environmental protection, in favour of a more sustainable pro-active approach.

The final reaction to hope for is that, just as management is becoming an integral part of environmental protection, environmental protection should become an integral part of business management.

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APPENDIX A

APPENDIX A

EMAS: LIST OF INDUSTRIAL ACTIVITIES OUTLINED UNDER THE EC REGULATION

Extraction and briquetting of solid fuels
Coke ovens
Extraction of petroleum and natural gas
Mineral oil refining
Nuclear fuels industry
Extraction and preparation of metalliferous ores
Production and preliminary processing of metals
Extraction of minerals other than metalliferous and energy- producing minerals
Peat extraction
Manufacture of non-metallic mineral products
Chemical industry
Man-made fibres industry
Manufacture of metal articles
Mechanical engineering
Manufacture of office machinery and data processing machinery
Electrical engineering
Manufacture of motor vehicles and of motor vehicle parts and accessories
Manufacture of other means of transport
Instrument engineering
Food, drink, and tobacco industry
Textile industry
Leather and leather goods industry
Timber and wooden furniture industries
Manufacture of paper and paper products
Printing and publishing
Processing of rubber and plastics
Electricity
Gas
Steam and hot water production
Recycling, treatment, destruction or disposal of solid or liquid waste.

The range of activies covered may be extended by Member States on a pilot or experimental basis.

APPENDIX B

EMAS: STATEMENTS OF PARTICIPATION

	This site has an environmental management system and its environmental performance is reported on to the public in accordance with the Community eco-management and audit scheme (Registration No...)
	All the sites in the Community where we carry out our industrial activities have an environmental management system and their environmental performance is reported on to the public in accordance with the Community eco-management and audit scheme. (Plus optional statement regarding practices in third countries)
	All the sites in [name(s) of the Community Member States(s)] where we carry out our industrial activities have an environmental management system and their environmental performance is reported on to the public in accordance with the Community eco-management and audit scheme
	The following sites where we carry out our industrial activities have an environmental performance reported on to the public in accordance with Community eco-management and audit scheme: - site name, registration number - - ...

APPENDIX C

EXPERIENCES FROM THE PILOT STUDY
Source: PA Consultants - 1993

As well as completing the self-assessment questionnaire to determine progress towards the Regulation requirements at the second workshop, participating companies were also asked a series of questions designed to assess how easy the Regulation was to implement in practice and to identify the main benefits and problem areas.

The questions were:

A. How workable/practical were the requirements of the Regulation?
B. How easy was it for you to comply?
C. Where did you have the biggest problems?
D. Has the exercise brought any benefits?
E. How applicable were the requirements to your industry sector?
F. How applicable were the requirements to your size of company?
G. How applicable were the requirements to your Member State?
H. Where would more help have been useful?

Companies responses to these questions are summarised in tables 6A-H. The following general comments were made.

A. How workable/practical were the requirements of the Regulation?

There was a general consensus that the original proposal from the Commission was very difficult to work with. It did not provide enough guidance about what was required. It was possible to interpret the requirements in such a way that the effort involved in meeting them would be so great as to make them unworkable. Some companies were already using the BS 7750 approach and found their task easier as a result. Others used BS 7750 as a model after the first series of workshops. These companies were therefore much happier with the final version of the Regulation which incorporates many of the principles of BS 7750. The only major adverse comment came from one of the large car manufacturers. This was that the Regulation is still too bureaucratic, demanding too much documentation from a site as large and complex as theirs. Several companies felt that the Regulation would be more practicable if more

precise requirements and performance standards were specified in sector application guides, and other issues such as the definition of site and the requirements for evaluation of environmental effects were clarified. Best available techniques (BAT) are being studied at EC level for several branches of industry and could be used as a basis for these requirements and standards.

B. How easy was it for you to comply?

Over half the companies found it straightforward to comply with their interpretation of the requirements of the Regulation. Many of these had residual uncertainties about whether their interpretation was correct. Difficulties were found by the group of suppliers to the car industry who felt that it would be very difficult for small companies to comply.

Difficulties were also found in companies in Italy, France and Denmark where the formal documented approach, required by the Regulation, does not fit as well with company culture and current management practices.

C. Where did you have the biggest problems?

Most of the companies had significant problems in interpreting the original version of the Regulation as proposed by the Commission. The final version was felt to be much clearer but a few companies felt that certain areas were still open to misinterpretation. This could be minimised by a summary of the Regulation and the provision of a more extensive glossary.

There was also some difficulty in knowing how to approach specific elements of the Regulation and in deciding on the scope and depth required, for example, in the policy, review, environmental effects evaluation, public statement.

The smaller companies found that the Regulation required significant input in terms of time, resources, in-house expertise and experience. To make significant progress they often also had to rely on one person trying to involve the whole site busy with its daily work. Many did not have the resources available and felt that the benefits to be gained may not be sufficient to warrant the large input required.

The level of detail required for the verification exercise was the cause of considerable discussion and uncertainty. Involvement of the companies participating in this pilot exercise with the development of guidelines for verifiers could serve to resolve some of these outstanding questions.

Performance assessment was another area generating much discussion, with particular uncertainty as to:

- the levels of performance which would be required by the Regulation
- the potential variability between Member States and industry sectors
- how performance should be measured

The companies who had progressed as far as generating a public statement cited several other potential problem areas, including:

- how to define and identify the "public"
- how to determine the level of detail required
- how best to present material to the public
- how to establish a logical sequence for the statement so that readers can readily understand what the company is doing to improve its environmental performance and why it is doing it.

D. Has the exercise brought any benefits?

All the participating companies identified some benefits from the pilot study, with most seeing the project as a means of focussing on environmental issues and raising general awareness within the company.

As would be expected from companies taking part in such a study, they also tended to see it as reinforcing their proactive stance on the environment and their desire to improve environmental performance.

Some companies cited "management assurance" as a major benefit, with the introduction of formal environmental management systems increasing management confidence in the workforce and the activities carried out. To quote, "we now know that the right decisions will be taken and the right activities set in place, as a matter of course, rather than relying on one person remembering to set activities in place".

Implementation of effective environmental management was seen to provide a way of gaining control of environmental pressures, of maintaining control of operations, and of helping to prioritise actions. In one case it was also seen to provide a way of demonstrating good management to external stakeholders, such as insurance companies.

Generally benefits were felt to be more of the more intangible kind, such as an enhanced image, but a few companies found actual cost savings in terms of reduced energy consumption and reduction in waste. One company identified a potential area of non-compliance during the pilot study and is now identifying the cause and rectifying the problem.

Participation in the scheme was also seen as very effective in terms of public relations, with the requirement to publish an environmental statement supported by an effective environmental management system.

E. How applicable were the requirements to your industry sector?

Companies within the chemicals sector all found the Regulation very applicable with its reinforcement of the Responsible Care Programme. It is of interest that companies within the chemicals sector have tended to group together and make their opinions known through CEFIC at the various stages of development of the Regulation. In consequence, most of their problems with the Regulation have been overcome during its development. This does not seem to have been the case to such an extent with other industries.

One company in the car/power plant manufacturing sector had some difficulties in meeting the Regulation's requirements because it has an integrated approach to environment, health and safety issues. The nature of the industry and its risks then produces a natural focus on health and safety issues, and identifying priorities specifically for environmental improvements becomes difficult.

The electricity generation company felt that power generators could have problems with the requirement for continual improvement. The environmental performance of an electricity generating station will often be almost entirely dependent on decisions taken at corporate level or on factors such as electricity demand, which in turn depends on the weather, which are completely outside the control of the plant.

The waste disposal company felt that particular consideration may need to be given to the application of the Regulation's requirements to waste landfill sites which go through several specific stages of life (site investigation, landfill operations, closure) each with their own different problems with respect to environmental management systems.

For the textile industry, which is typically composed of small companies with strong links along the supply chain, limiting the scheme to a single site rather than to the whole supply chain is seen as a problem area.

F. How applicable were the requirements to your size of company?

The general consensus here appeared to be that the Regulation would be applicable to most medium and large companies, but would pose problems for smaller companies. One of the larger companies did however express the view that the pressure to improve, where there is already severe legislative pressure on environmental performance, might lead to greater pressure on larger, well known companies, with good environmental standards. This could result in these companies choosing not to participate in the scheme.

Another large company found problems purely because of the size and complexity of their site which meant that just carrying out the review and setting up a programme from scratch were considerable tasks.

The general feeling among the smaller companies was that it would be difficult for them to comply without help to meet their particular circumstances, in particular:

- lack of in-house expertise
- lack of dedicated resources
- limited funding
- lack of relevant training and development resources

Allocation of adequate resources in a small company was also seen to require substantial commitment from the senior management.

G. How applicable were the requirements to your Member State?

All the UK companies found the Regulation very applicable with its good fit with BS 7750 and its reinforcement of the UK's integrated pollution control approach to the regulation of environmental pollution from industrial activities. It also fits well with UK company culture and its approach to management systems.

In contrast the formal documented systems required by the Regulation do not seem to fit as well with the more informal approach in Italy and Denmark. In Italy there are additional problems due to the criminal implications of failing to meet environmental legislation.

The Regulation is generally compatible with German law. However German companies may feel the need for more assurance that only the highest levels of performance will be acceptable for Eco-management and audit registration. They see German environmental standards as the highest in Europe and would not want to see companies in other Member States achieving registration with lower standards.

It is interesting to note that the two companies in the pilot study with US parent companies were seen as taking the lead in terms of Environmental Management for the rest of the group.

H. Where would more help have been useful?

Most participants agreed that more guidance would be helpful in the following areas:

- Explanatory Summary of the Regulation
- Interpretation of Regulation requirements
- Examples of
  - policy statements
  - objectives
  - programme
  - operational control
  - management systems
  - environmental statement

- Acceptable performance levels
- Levels of detail required for procedures
- How to evaluate environmental effects
- How to conduct environmental impact assessments and what level of detail is required
- Clearer definition of boundaries and degree of detail required in different areas
- Information on how to carry out an initial review.

Specific, documented case studies with examples of policy, objectives, programmes and external statements were seen as being potentially most useful.

A summary of the Regulation would be particularly useful to explain the scope and purpose of the scheme. A common misconception at the start of the pilot exercise (when the title was the Eco-Audit scheme) was that the scheme concerned compliance audits and environmental protection technology. This problem has been addressed to some extent by the change in title to Eco-management and audit, but a summary would reinforce this.

Working groups were seen as useful mechanisms for future progress on the Regulation. The group of suppliers to the car manufacturing industry found that they benefited greatly from working in a group, sharing experiences and having access to specialist expertise. They feel that such an arrangement would be particularly useful for small companies beginning to implement the Regulation.

APPENDIX D

Analyses of database (MARCH 1994)

Industrial Sector	Totals All	Totals Mfg	Totals Dis	Totals Ser	Manufacturing 0	5	10	20	50	100	250	1000	1000+	Distribution 0	5	10	20	50	100	250	1000	1000+
	689	75	45	470	8	17	9	13	16	4	7	1	0	3	14	8	9	8	2	1	0	0
Agriculture & fishing	126	51	16	75	1	9	6	13	14	4	4	0	0	0	2	3	1	6	2	2	0	0
Mining & Minerals	35	26	15	11	0	2	3	9	8	1	1	1	1	0	1	1	5	5	1	1	0	1
Food & drink	836	736	178	84	8	53	83	135	185	108	96	58	10	2	13	19	30	57	24	22	11	0
Textiles & clothing	550	490	53	65	14	26	50	74	147	75	63	37	4	0	6	15	8	11	5	6	2	0
Wood & Furniture	426	368	56	89	14	47	66	92	112	28	8	1	0	1	6	11	13	16	5	2	2	0
Paper, Print & publishing	697	213	80	510	3	12	28	45	65	28	25	7	0	1	11	21	17	17	7	5	1	0
Plastics & rubber	458	395	104	96	13	57	53	75	99	46	38	14	0	3	23	23	21	24	7	1	2	0
Chemical & pharmaceutical	378	301	148	86	5	35	40	55	87	26	42	10	1	3	28	33	27	33	8	12	4	0
Non Metallics	273	243	56	48	8	36	29	49	63	34	12	10	2	1	11	11	7	19	4	2	1	0
Engineering	1304	895	311	623	17	186	193	184	185	66	44	18	2	13	71	72	67	59	15	12	2	0
Electrical & electronics	649	454	252	196	12	50	67	80	100	52	53	37	3	11	53	54	50	41	16	19	7	1
Industrial Equipment	458	325	169	176	5	59	52	80	97	25	10	7	0	4	47	39	37	26	7	7	1	1
Construction	952	51	58	948	2	5	9	10	17	6	2	0	0	1	12	8	18	13	2	1	3	0
Distributive trades	2206	184	1837	614	4	27	35	49	38	18	8	5	0	64	460	369	413	346	118	43	18	6
Transport & communication	547	8	28	534	0	0	2	1	3	2	0	0	0	0	3	7	7	7	2	1	1	0
Business Services	2086	99	92	2029	2	19	22	22	19	8	5	2	0	4	30	19	12	20	5	1	1	0
Financial Services	1097	3	20	1091	0	0	0	1	0	0	0	0	2	1	4	4	5	3	1	1	1	0
Technical Services	1196	27	32	1186	0	6	6	6	4	2	3	0	0	3	6	8	5	4	2	3	0	1
TOTAL	14963	4944	3550	8931	116	646	753	993	1249	533	421	208	25	115	801	725	752	715	233	142	57	10

Industrial Sector	Service 0	5	10	20	50	100	250	1000	1000+	All Categories 0	5	10	20	50	100	250	1000	1000+
	40	187	97	61	57	17	6	5	0	93	245	125	89	85	28	15	9	
Agriculture & fishing	3	16	6	18	24	4	4	0	0	4	23	13	30	38	10	8	0	0
Mining & Minerals	0	0	1	4	2	1	2	1	0	0	2	4	12	11	1	2	1	2
Food & drink	2	6	7	12	21	15	14	3	4	10	66	96	157	214	117	106	60	10
Textiles & clothing	3	8	5	10	19	10	4	5	1	16	34	59	82	167	83	66	39	4
Wood & Furniture	6	15	15	16	22	6	8	1	0	18	57	76	105	125	31	11	3	0
Paper, Print & publishing	19	91	114	121	112	29	19	5	0	23	106	142	161	163	50	41	11	0
Plastics & rubber	1	16	11	16	31	11	9	1	0	15	79	70	85	110	47	38	14	0
Chemical & pharmaceutical	4	11	7	17	29	8	9	1	0	11	59	62	65	95	29	44	12	1
Non Metallics	0	9	6	10	16	4	2	1	0	9	44	35	55	72	34	12	10	2
Engineering	11	157	137	130	108	47	23	8	2	32	312	281	269	251	83	52	21	3
Electrical & electronics	10	31	23	37	45	19	23	7	1	28	104	107	107	130	64	63	42	4
Industrial Equipment	1	39	35	48	37	11	4	0	1	9	107	83	109	99	29	13	8	1
Construction	54	140	181	191	256	82	28	15	1	54	141	183	191	256	83	28	15	1
Distributive trades	26	120	95	108	147	47	40	21	10	81	497	412	465	453	164	81	39	14
Transport & communication	36	79	100	117	110	43	26	12	11	36	80	105	119	113	44	27	12	11
Business Services	181	794	398	256	182	85	71	49	13	183	809	410	267	192	87	73	52	13
Financial Services	71	510	168	104	86	41	51	46	14	71	512	168	107	87	41	51	46	14
Technical Services	117	528	187	140	121	39	32	18	4	117	532	192	141	121	39	32	18	4
TOTAL	585	2757	1593	1416	1425	519	375	199	62	810	3809	2623	2616	2782	1064	763	412	84

County	Totals All	Totals Mfg	Totals Dis	Totals Ser	Manufacturing 0	5	10	20	50	100	250	1000	1000+	Distribution 0	5	10	20	50	100	250	1000	1000+
Antrim	590	234	154	253	4	7	13	56	77	35	26	15	1	4	12	15	43	52	19	8	1	0
Armagh	210	114	31	68	0	2	8	20	39	19	16	9	1	0	5	4	1	11	6	2	2	0
Belfast	971	223	259	565	1	6	24	49	82	18	24	17	2	2	25	48	56	82	26	10	10	0
Carlow	107	57	19	53	1	14	6	6	18	6	4	2	0	0	7	2	3	2	4	1	0	0
Cavan	133	78	21	59	5	17	9	22	12	3	9	1	0	0	7	3	5	4	1	0	1	0
Clare	238	117	36	149	1	23	15	17	31	13	15	2	0	1	15	3	5	7	2	3	0	0
Cork	1151	404	230	773	8	50	64	62	106	47	46	18	3	6	54	48	48	47	17	8	2	0
Derry	252	103	40	121	0	2	7	23	41	10	9	8	3	0	6	6	8	13	5	1	1	0
Donegal	204	117	31	92	3	15	15	25	29	15	12	2	1	1	10	5	4	6	3	1	1	0
Down	419	197	78	174	1	10	14	35	82	23	18	14	0	2	9	9	20	33	4	1	0	0
Dublin	6507	1382	1886	4281	37	211	272	293	311	126	86	41	5	61	455	424	402	332	101	75	28	8
Fermanagh	51	23	8	21	0	0	2	3	11	2	4	1	0	0	0	0	1	5	1	0	0	1
Galway	488	191	84	304	3	32	32	44	43	23	7	7	0	3	22	15	23	13	3	4	1	0
Kerry	209	87	22	130	0	12	10	27	14	10	5	8	1	0	3	7	3	6	2	0	1	0
Kildare	297	122	58	177	4	21	19	22	31	13	5	6	1	1	19	10	14	10	2	2	0	0
Kilkenny	164	68	31	99	3	12	17	12	13	6	2	2	1	1	12	8	3	5	1	0	1	0
Laois	69	30	19	35	2	4	6	4	8	2	2	2	0	0	4	1	6	4	2	2	0	0
Leitrim	57	32	9	31	4	3	5	9	4	5	2	0	0	1	2	3	2	0	1	0	0	0
Limerick	394	157	73	231	2	21	20	36	34	20	16	8	0	4	15	15	15	15	5	3	1	0
Longford	56	23	8	33	0	7	1	2	5	4	3	1	0	0	2	1	0	3	1	1	0	0
Louth	329	172	65	165	4	25	37	30	42	13	12	6	3	7	16	23	9	6	3	0	1	0
Mayo	134	67	18	79	4	10	9	12	16	7	6	3	0	2	2	3	5	4	1	1	0	0
Meath	194	103	35	108	2	11	18	23	26	12	6	5	0	2	6	12	7	5	2	0	1	0
Monaghan	152	104	27	64	9	13	19	22	18	11	10	2	0	1	6	5	6	4	1	4	0	0
Offaly	111	64	15	46	0	16	11	5	16	6	9	1	0	1	3	1	4	1	3	2	0	0
Roscommon	78	37	16	49	1	5	3	8	10	4	1	1	0	0	5	3	3	3	1	0	1	0
Sligo	141	67	24	75	2	16	9	15	11	8	2	4	0	1	11	2	6	2	2	0	0	0
Tipperary	215	104	34	127	4	16	12	16	16	16	19	5	0	1	9	5	9	6	1	2	1	0
Tyrone	176	95	40	56	0	4	5	23	31	21	6	4	1	1	2	6	9	13	6	2	0	1
Waterford	237	110	42	147	4	16	26	17	19	9	11	6	2	4	14	11	5	4	3	1	0	0
Westmeath	130	49	25	85	1	4	6	10	6	5	9	3	0	0	10	8	2	3	0	1	1	0
Wexford	244	103	52	143	2	15	18	22	23	9	10	4	0	2	14	7	14	6	2	5	2	0
Wicklow	255	110	60	136	4	17	21	23	24	12	9	0	0	6	19	12	11	8	2	2	0	0
TOTAL	14963	4944	3550	8931	116	646	753	993	1249	533	421	208	25	115	801	725	752	715	233	142	57	10

County	Service 0	5	10	20	50	100	250	1000	1000+	All Categories 0	5	10	20	50	100	250	1000	1000+
Antrim	8	22	28	48	86	33	21	7	0	16	40	51	132	196	80	53	21	1
Armagh	4	10	3	13	21	12	4	1	0	5	15	15	34	72	37	20	11	1
Belfast	10	55	66	118	164	66	48	24	14	17	83	125	206	295	102	81	47	15
Carlow	3	23	7	8	8	2	2	0	0	4	38	13	13	23	9	5	2	0
Cavan	3	21	9	7	9	3	5	2	0	8	40	15	31	19	7	11	2	0
Clare	4	46	19	23	32	11	12	2	0	7	68	27	34	56	21	21	4	0
Cork	22	302	150	109	105	37	30	15	3	39	371	217	168	187	72	63	30	4
Derry	2	11	23	27	39	9	9	1	0	3	17	35	53	91	22	18	10	3
Donegal	3	39	14	13	13	6	2	1	1	7	55	29	38	41	18	13	2	1
Down	7	25	29	25	59	19	8	1	1	9	41	51	75	159	44	25	14	1
Dublin	392	1325	840	653	566	200	154	114	37	483	1820	1345	1108	950	349	245	164	43
Fermanagh	1	3	0	2	11	3	1	0	0	1	3	2	6	26	6	5	1	1
Galway	9	121	48	52	37	24	9	3	1	16	164	79	96	73	38	11	10	1
Kerry	5	55	25	20	13	5	5	2	0	5	67	34	43	26	14	9	10	1
Kildare	10	78	29	20	28	5	4	3	0	14	112	44	39	51	17	9	9	2
Kilkenny	4	38	21	16	10	6	2	2	0	8	53	36	25	22	11	4	4	1
Laois	8	9	8	6	3	0	1	0	0	9	14	11	13	14	3	3	2	0
Leitrim	6	7	7	3	2	4	1	0	1	11	11	10	11	5	5	3	0	1
Limerick	10	85	45	39	31	12	4	7	0	18	108	68	74	63	31	17	15	0
Longford	2	14	4	4	4	3	2	0	0	2	22	6	6	9	5	5	1	0
Louth	12	50	33	36	24	4	4	0	2	20	78	68	63	61	15	14	7	3
Mayo	8	30	12	16	11	1	0	1	0	12	38	19	23	24	8	6	4	0
Meath	6	39	12	18	21	7	3	2	0	9	52	32	36	37	15	7	6	0
Monaghan	2	16	11	18	8	3	6	0	0	11	29	29	31	24	12	14	2	0
Offaly	0	26	5	4	7	0	3	0	1	1	41	18	11	21	7	10	1	1
Roscommon	0	17	11	6	12	1	1	1	0	1	25	14	11	18	5	2	2	0
Sligo	3	26	17	14	9	3	2	1	0	6	50	26	28	17	9	3	4	0
Tipperary	5	54	19	21	12	7	9	0	0	8	68	31	35	28	17	23	5	0
Tyrone	1	6	9	10	18	9	2	1	0	3	11	19	37	57	32	10	5	2
Waterford	11	47	28	22	26	5	4	3	1	17	62	49	37	34	14	14	8	2
Westmeath	1	33	21	11	7	3	6	3	0	2	46	27	21	12	7	11	4	0
Wexford	5	60	17	24	16	12	7	2	0	8	79	35	45	37	19	16	5	0
Wicklow	18	64	23	10	13	4	4	0	0	10	88	45	33	34	13	12	0	0
TOTAL	585	2757	1593	1416	1425	519	375	199	62	810	3809	2623	2616	2782	1064	763	412	84

Employee Bands: 0: *Not Given*, 5: *1-5*, 10: *6-10*, 20: *11-20*, 50: *21-50*, 100: *51-100*, 250: *101-250*, 1000: *251-1000*, 1000+: *Over 1000*