

## ENVIRONMENTAL MANAGEMENT SYSTEMS

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#### **1.0 Background**

Environmental management (EM) is the process of managing the environmental issues associated with an organisation's activities. There is no one definition for EM, but, in general, it can be said to encompass all the activities and technologies necessary to manage an organisation's environmental performance.

An environmental management system (EMS) is the term used to describe the overall management system a firm can use to integrate environmental issues within the existing management and operating systems, thus enabling the company to conduct its activities while ensuring the associated environmental impacts are managed.

Environmental management is based on the concept of continuous improvement of an organisation's environmental performance over time. In this way, an EMS is continuously changing in line with the organisation's activities as well as external influencing factors such as environmental legislation, changes in technology, and market pressures. This dynamic nature allows organisations to improve their environmental performance at a rate and to the level relevant to them.

The structure of an EMS is defined in the standard ISO 14001 or by the Eco-Management and Audit Scheme (EMAS). Companies that develop an EMS in line with either or both of these

systems can have the system certified and hold a third party accreditation for it. The benefit of an accredited EMS is that it demonstrates that a company is managing its environmental performance in line with internationally accepted schemes. More and more firms are finding this is a business benefit.

EMAS and ISO 14001 are typical examples of the shift in environmental policy away from the traditional ‘command and control’ environmental legislative instruments to the use of voluntary schemes and market-based instruments. Furthermore, in support of the concept of sustainable development, EMAS and ISO 14001 provide a new approach for controlling environmental issues.

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### **1.1 ISO 14001**

*ISO 14001 - Environmental Management Systems - Specification with guidance for use* (ISO14001; 2004) is an international standard that specifies the content of an EMS. An EMS that meets this specification may certify to the standard and avail of the associated benefits. Guidance on developing an EMS, but not necessarily for certification, is detailed in another international standard *ISO 14004 EMS - General guidelines on principles, systems and supporting techniques* (ISO 14004: 1996 (E)).

[ISO 14000](#) is a suite of standards and guidance documents on a range of topics relevant to the environmental management of industrial processes and products.

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### **1.2 Eco-Management and Audit Scheme**

The [Eco-Management and Audit Scheme \(EMAS\)](#) is a management tool for organisations to evaluate, report and improve their environmental performance. The scheme has been available since 1995 and was revised in 2001. The current EMAS specification is defined in Regulation (EC) No 761/2001. Unlike many EU Regulations, there is no legal obligation to use EMAS; it is available for adoption on a voluntary basis.

EMAS is an environmental management scheme, whereby organisations develop an EMS (to ISO 14001 or in line with the EMS specified in EMAS) and an externally verified Environmental Statement as per the provisions of the EMAS Regulation. This enables them to register under the EMAS whereby they may use the EMAS logo and become listed in the Register of EMAS sites.

EMAS is open to all industry and economic sectors. Participation extends to public and private organisations operating in the European Union and the European Economic Area.

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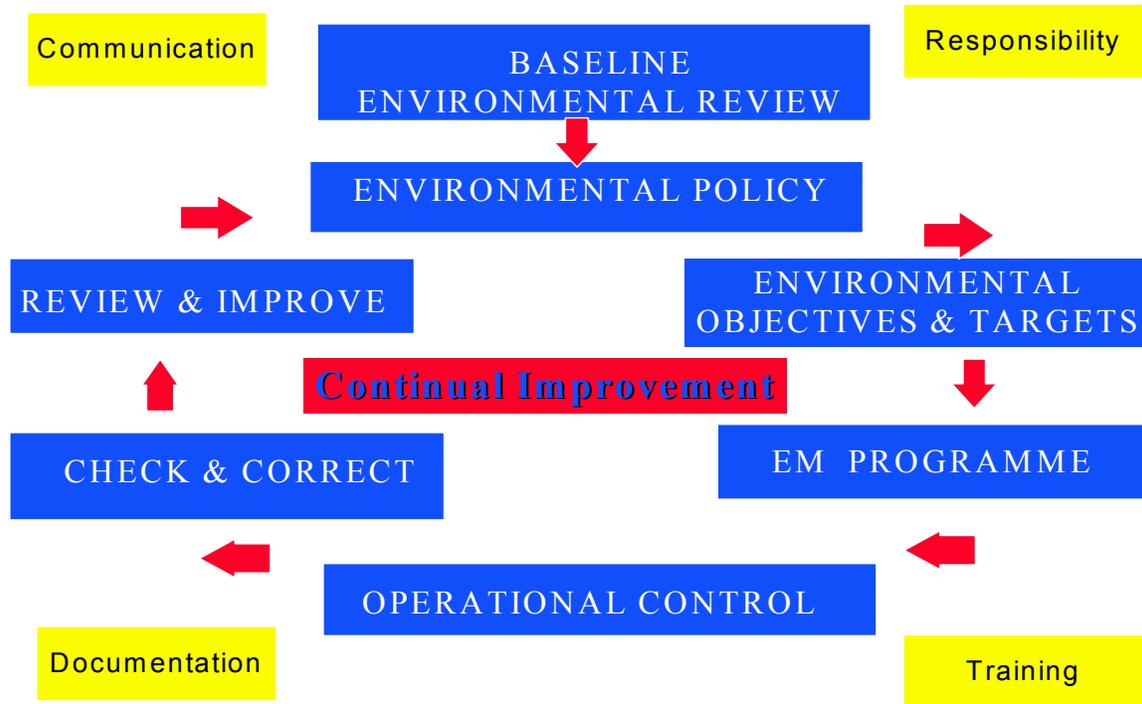
### **1.3 EMS and IPPC licensing**

Any site in possession of an Integrated Pollution Prevention and Control (IPPC) License or a Waste Management License from the Irish Environmental Protection Agency (EPA) is required to develop an EMS for the management of all environmental issues. There is currently no requirement within the licensing systems to achieve certification to the ISO 14001 standard or to EMAS; however, many licensed companies see certification of the EMS as an added benefit. Condition 2 of the licence defines the requirements for the EMS.

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## 2.0 EMS structure and elements

While the specific components of an EMS (as defined under the ISO 14001 specification, EMAS Regulation or in a license) may vary, the general structure behind the EMS concept is largely the same. The components of a typical EMS are illustrated in the diagram below.



A typical EMS incorporates the following elements.

- Baseline Environmental Review/Audit
- Planning
  - ⇒ Environmental Policy
  - ⇒ Environmental Objectives and Targets
  - ⇒ EM Programme
- Implementation and Operation
  - ⇒ Operational Control
  - ⇒ Emergency Preparedness and Response
  - ⇒ Responsibility Allocation
  - ⇒ Awareness and Training
  - ⇒ Communications
- Check and Review
  - ⇒ Checks and Corrective Action
  - ⇒ Ongoing Review & Improvement
- Documentation

A summary of each of these components is below.

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## **2.1 Baseline Environmental Review/Audit**

At the beginning of an EMS development, a baseline environmental review/audit is normally conducted in order to determine the status of the organisation's environmental performance. This audit should feature a comprehensive identification and evaluation of all the significant environmental impacts and issues relevant to the organisation's activities at the site. The size of an audit and time scale for conducting it will largely be determined by the size of the organisation and complexity of the site activities. For EPA licensed sites, the collation of data and completion of the application process is largely similar to conducting a baseline environmental audit.

The issues to be considered in an audit will vary depending on the organisation, its location and the type of activities conducted.

Typical factors normally considered in an environmental audit include the following:

- Compliance with environmental legislative requirements
- Air emissions (sources, composition, quantity, abatement systems, emission points, receiving environment)
- Water emissions (sources, composition, quantity, abatement systems, disposal routes, receiving environment)
- Waste generation, collection and disposal
- Waste management /minimisation practices
- Energy usage and conservation measures
- Storage, handling and containment of hazardous/potentially hazardous substances
- Raw material usage especially for non-renewable resources
- Noise
- Odour
- Flora, fauna and landscape
- Surrounding land-use activities
- Environmental sensitivity associated with the site or its location, such as adjacency to a stream or overlying an aquifer
- Previous site uses and any residual contamination

Audits are normally conducted via site surveys, discussions with relevant site personnel and other third parties as relevant. Depending on the site requirements, environmental monitoring of, for example, surface water, groundwater, soil or air may be conducted. The baseline audit should be comprehensively documented as it provides the basis for the development of the remaining EMS components. There are currently three international standards in the ISO 14000 suite (ISO 14010 – 14012), providing guidance on environmental auditing.

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## **2.2 Planning**

Based on the findings of the Baseline Environmental Review/Audit, the environmental improvements necessary should be clear. The next phase is to plan a way forward for ensuring that improvement measures are implemented in a realistic and timely manner. This involves specifying an Environmental Policy, defining objectives and targets and devising an Environmental Management action Programme.

### Environmental Policy

Based on the audit, an environmental policy statement is developed to define the overall environmental aims of the company. This is typically a one-page statement, stating the actual, realistic (not aspirational) environmental aims, committed to by the senior management and

signed off by the head of the company.

#### Environmental Objectives and Targets

Based on the audit, a schedule of objectives and targets is established for a specified time scale, following on from the policy. Initially, the objectives are largely based on environmental legislative requirements, such as the conditions of a license, where these are not already in place. As the aim is to improve environmental performance over time, objectives and targets will be revised and updated over time, in light of license reviews, site requirements etc.

#### Environmental Management Programme (EM Programme)

Finally, the EM Programme is developed as an action plan for achieving the objectives and targets. It includes information on the means, time-frame and allocation of responsibility necessary to achieve these.

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### **2.3 Implementation and operation**

#### Operational control

Practical operational control seeks to oversee site activities, which, if they were not controlled, could have a significant adverse environmental impact. Typical operational control measures include

- Operation of site-related technology in line with relevant license requirements or best practice
- Development and use of operational procedures for operations, monitoring and so on
- Implementation of environmental monitoring programmes as defined in relevant licenses or in line with best practice.

#### Emergency planning and response

As environmental impacts can occur as the result of an emergency situation at an industrial facility (e.g. spillage of a hazardous substance, fire generating contaminated fire water or explosion releasing a toxic gas), these potential scenarios are identified and appropriate control measures are put in place to limit and mitigate the likely environmental impacts.

#### Responsibility allocation

Within the EMS, the role of an Environmental Manager/Officer for the site is allocated. This person champions the EMS development and takes responsibility for the day-to-day running of the EMS once implemented. Specific requirements for site management and staff as required under the license would be incorporated in this section of the EMS.

#### Awareness and Training

Procedures for identifying the environmental training needs of personnel and providing training as relevant are put in place.

#### Communications

A programme is developed to ensure appropriate internal and external communications regarding environmental issues relevant to the site. This incorporates all relevant stakeholders and should ensure appropriate access to information on the organisation's environmental performance is made available. Typically, the Environmental Policy Statement is used to disseminate information to the public on the company environmental aims. Dependant on license requirements, a variety of environmental performance data, such as environmental monitoring data, records and annual environmental reports are made available to the Regulatory Authority and are in the public domain. It is increasingly common for companies to include environmental

performance information in Annual Reports, provide specific Annual Environmental Reports and include environmental information on their websites.

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## **2.4 Check and review**

### Checks and corrective action

Checks are normally conducted on an ongoing basis to ensure that the EMS is operating effectively and to ensure corrective action is taken if EMS elements are not appropriately implemented.

### Review and improve

Inherent in the EMS concept is the requirement for on-going assessment of operations with a view to improving environmental performance over time. Once the EMS is operational, reviews are conducted at a suitable frequency in order to ensure the ongoing suitability and effectiveness of the EMS. After the review process, the Policy Statement, Schedule of Objectives and targets, EM programme and other aspects of the EMS may need to be updated. This review will not normally be as comprehensive as the baseline environmental review, but many of the same issues will be considered.

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## **2.5 Documentation**

To facilitate implementation, the essential elements of the EMS are documented in electronic or paper-based format. This may be in the form of an Environmental Management Manual and as part of the existing site operational documentation. As resource conservation is likely to be a key aim in an EMS, the documentation should not be highly paper intensive.

### Records and reporting

Within the EMS documentation, a records and reporting system, typically based on regulatory authority requirements, is developed. Examples of such records and reports include

- Records of all environmental monitoring
- Records of the waste generated and associated disposal and/or recycling routes
- Relevant licenses and/permits for waste contractors used
- Records of environmental audits and reviews
- Environmental performance reports.

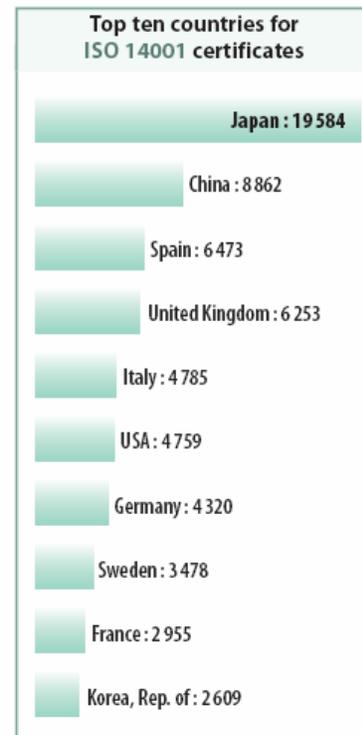
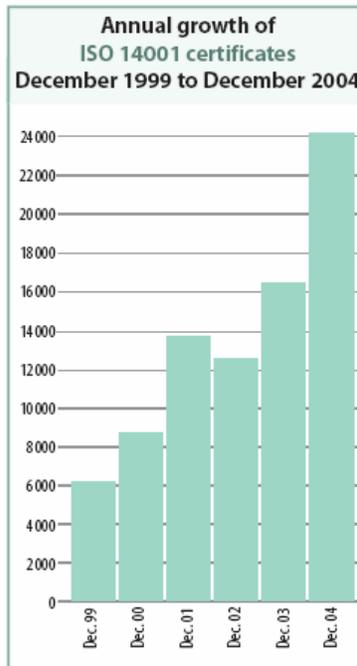
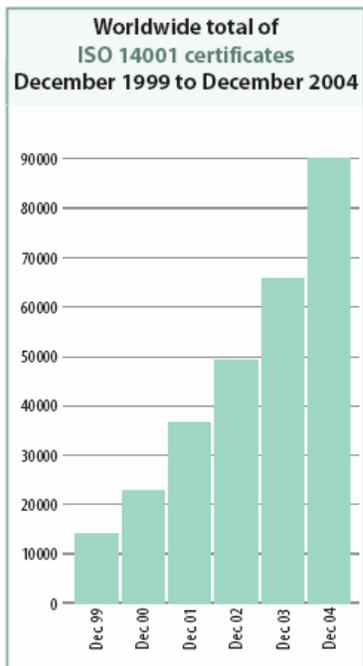
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### 3.0 EMS uptake Worldwide and in Ireland

For companies based in Ireland, approximately 290 industrial sites have ISO 14001, and 8 are accredited to EMAS. In the public sector, the Irish Department of the Environment, Heritage and Local Government hold ISO14001. The global status of ISO14001 certifications worldwide are illustrated in the tables below (Source: The ISO Survey, 2004). As of 2004, the numbers of ISO 14001 certifications worldwide are 90 569, an increase of 37 %, in 127 economies. Worldwide, the service sectors account for the highest number of ISO 14001 certificates, about 31 % of the total.

#### ISO|14001 principal results

World results	Dec. 1999	Dec. 2000	Dec. 2001	Dec. 2002	Dec. 2003	Dec. 2004
World total	14 106	22 897	36 765	49 449	66 070	90 569
World growth	6 219	8 791	13 868	12 684	16 621	24 499
Number of countries/ economies	84	98	112	117	113	127



Overall, worldwide and in Ireland, the use of EMS as a tool for managing environmental issues at industrial activities is increasing. This is mainly being driven by compliance; however, voluntary accreditations to ISO 14001 are also increasing steadily. From a business perspective, ISO 14001 is now common in multinational corporations, and it is fast becoming a pre-requisite to doing business through the supply chain. Industries with the highest ISO 14001 certification in Ireland are the electronics, IT, and optical sector at 43%, followed by food and beverages at 20% and chemicals and pharmaceuticals at 10-15% (Certification Ireland, 2001). Small and Medium Size

Enterprises are taking an increasing interest in ISO 14001, mainly via market pressure from customers through the supply chain.

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