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WHITEPAPER

ISO 14001

ENVIRONMENTAL MANAGEMENT SYSTEM

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INTRODUCTION

ISO 14001 is the world's most recognized environmental management standard applicable to organizations of all sizes wishing to set up an effective environmental management system, in order to meet their environmental and economic goals.

ISO 14001 provides assurance to company management, employees and external stakeholders that environmental impact is being measured and improved.

By implementing an EMS (Environmental Management System), based on the ISO 14001 standard, organizations enhance their positive image in the area of business, governance and against local communities. Other benefits include reduced waste, increase of environmental protection, improvement of environmental performance and compliance with legislation.

The EMS may apply to an entire organization, or an operating unit and it is required to conduct a periodic review and evaluation of the EMS to identify issues and opportunities for continual improvement.

The top three countries for the total number of certificates issued were China, Italy and Japan, while the top three for growth in the number of certificates in 2013 were China, Italy and India.

Up to the end of December 2013, at least 301, 647 certificates had been issued in 171 countries, four more than in the previous year. The 2013 total represents an increase of 6 % (+16 993) over 2012.

The table below summarizes the statistics of the ISO 14001 certifications around the world.

Standard	Number of certificates in 2013	Number of certificates in 2012	Evolution	Evolution in %
ISO 14001	301,647	284,654	16,993	6 %

Source: iso.com



AN OVERVIEW OF ISO 14001:2004



ISO 14001 specifies the requirements to implement an Environmental Management System (EMS), by enabling organizations to implement a policy and by defining environmental targets and objectives, by also taking into account legal and other requirements. ISO 14001 provides a set of guidelines intended to provide assistance to managers in various aspects of environmental management. These guidelines provide information for evaluating an organization's environmental performance and management system.

The ISO 14001 International Standard is the only certifiable standard from the ISO 14000 family. ISO 14001 is based on the methodology known as Plan-Do-Check-Act (PDCA). PDCA can be briefly described as follows:

- Plan: establish the objectives and processes necessary to deliver results in accordance with the organization's environmental policy.
- Do: implement the processes.
- Check: monitor and measure processes against environmental policy, objectives, targets, legal and other requirements, and report the results.
- Act: take actions to continually improve performance of the environmental management system.

Environmental management is improved with ISO 14001 by incorporating

- An operational EMS applicable to any organization wishing to increase the effectiveness and efficiency of its processes related to environmental management;
- Feasible environmental policy and planning, with the aim to ensure the sustainable environmental management;
- Clearly defined measurable and practicable objectives and targets that are in cohesion with legal and other requirements; and
- Management commitment and defined resources, roles, responsibilities and authority.

ISO 14001 applies to all types and sizes of organizations that wish to:

1. Establish, implement, maintain and improve an EMS;
2. Improve practices to reduce the environmental impacts;
3. Assure compliance with national, regional and international laws and treaties;
4. Increase confidence of clients, business partners and other interested parties; and
5. Make a self-determination and self-declaration of conformity with this International Standard.

KEY CLAUSES OF ISO 14001:2004

ISO 14001 is organized into the following main clauses:

- Clause 4.1: General requirements
- Clause 4.2: Environmental policy
- Clause 4.3: Planning
- Clause 4.4: Implementation and operation
- Clause 4.5: Checking
- Clause 4.6: Management review

CLAUSE 4.1: GENERAL REQUIREMENTS

The organization should establish, document, implement, maintain and continually improve an environmental management system in accordance with the requirements of this International Standard, and determine how it will fulfill these requirements.

The organization shall define and document the scope of its environmental management system.

The organization must focus on its management commitment, and obtain the resources needed to implement and maintain the environmental management system in accordance with the ISO 14001 Standard requirements.

CLAUSE 4.2: ENVIRONMENTAL POLICY

The environmental policy is developed as a statement of commitment from top management, which reflects the ethical values of the organisation and commitment to environmental protection.

Top management shall define the organization's environmental policy and ensure the defined scope of its environmental management system, by ensuring that it:

- Is appropriate to the nature, scale and environmental impacts of its activities, products and services;
- Includes a commitment to continual improvement and prevention of pollution;
- Includes a commitment to comply with applicable legal requirements and with other requirements to which the organization subscribes which relate to its environmental aspects;
- Provides a framework for setting and reviewing environmental objectives and targets;
- Is documented, implemented and maintained;
- Is communicated to all persons working for or on behalf of the organization; and
- Is available to the public.

CLAUSE 4.3: PLANNING

Environmental Aspects: Are causes of the environmental changes that affect the surrounding environment and usually incorporate the following:

- Energy resources and raw materials (coal, gas, oil);
- Air pollution from substances (carbon and sulphur dioxide, lead);
- Accidental releases (fires, smoke, toxic gases);
- Development of land, drainage, pest control, changes to natural habitats; and
- Products and by-product (pipes, energy efficiency, green IT).

Legal and other requirements : Organizations shall comply with applicable legal requirements and other requirements, to which the organization subscribes, in order to establish, implement and maintain an environmental management system.

This includes all relevant regulations (local and international, particularly if you deal with overseas clients) and other self-imposed requirements (codes of practice, client requirements).

Objectives, targets and programmes(s): Are tools that help control the significant environmental aspects and impacts in accordance with the requirements.

These programme(s) shall include:

- The designation of responsibility for achieving objectives and targets at relevant functions and levels of the organization; and
- The means and time-frame by which they are to be achieved.

CLAUSE 4.4: IMPLEMENTATION AND OPERATION

Resources, roles, responsibility and authority: Management shall ensure the availability of resources, roles, responsibility and authority essential to establish, implement, maintain and improve the environmental management system.

These resources include:

- Human resources and specialized skills;
- Organizational infrastructure;
- Technology; and
- Financial resources.

Competence, training and awareness: The organization shall ensure that any person(s) performing tasks for it or on its behalf that have the potential to cause a significant environmental impact(s) identified by the organization is (are) competent on the basis of competence, training and awareness.

The organization shall assure that the persons working for it, or on its behalf, are aware of:

- The importance of conformity with the environmental policy and procedures and with the requirements of the environmental management system;
- The significant environmental aspects and related actual or potential impacts associated with their work, and the environmental benefits of improved personal performance;
- Their roles and responsibilities in achieving conformity with the requirements of the environmental management system; and
- The potential consequences of departure from specified procedures.

Communication: With regard to its environmental aspects and environmental management system, the organization shall establish, implement and maintain a procedure(s) for internal and external communication.

Documentation: The environmental management system documentation shall include:

- The environmental policy, objectives and targets;
- Description of the scope of the environmental management system;
- Description of the main elements of the environmental management system;
- Documents, including records, required by this international standard; and
- Documents, including records that ensure the effective planning, operation and control of processes.

Control of documents: All documentation required by the environmental management system and by ISO 14001 shall be controlled.

Operational control: The organization shall identify and plan those operations that are associated with significant environmental aspects consistent with its environmental policy, objectives and targets, to ensure that they are carried out under specified conditions.

Emergency preparedness and response: The organization shall identify potential emergency situations and accidents that can have an impact on the environment. The organization shall respond to emergency situations, and shall periodically review, revise and test its emergency preparedness procedures.

CLAUSE 4.5: CHECKING

This clause includes a series of processes that are usable for measuring and monitoring the effectiveness of the organization's environmental policy, in addition to implementing the processes used to monitor non-conformance with respect to the EMS.

These processes incorporate measuring, monitoring, analysis and evaluation, which are required to ensure the achievement of the EMS objectives and targets, as well as assuring that significant environmental aspects are being controlled.

Internal audits shall be conducted at planned intervals to determine whether the environmental management system conforms to the requirements of ISO 14001, and has been properly implemented and maintained.

CLAUSE 4.6: MANAGEMENT REVIEW

The organization's environmental management system shall be reviewed at planned intervals, in order to ensure its continuing suitability, adequacy and effectiveness.

- The management reviews shall include:
- Results of internal audits and evaluations of compliance with legal requirements and with other requirements to which the organization subscribes;
- Communication(s) from external interested parties, including complaints;
- The environmental performance of the organization;
- The extent to which objectives and targets have been met;
- Status of corrective and preventive actions;
- Follow-up actions from previous management reviews;
- Changing circumstances, including developments in legal and other requirements related to its environmental aspects; and
- Recommendations for improvement.

LINK BETWEEN ISO 14001 AND OTHER STANDARDS

ISO 14001 can be easily linked with the ISO 9001, ISO 50001 and OHSAS 18001 standards, since all these standards closely follow the principles of a quality management system (Plan, Do, Check and Act).

Since there is a solid relation between ISO 14001 and the standards mentioned above, also considering that most of the EMS clauses in these standards are similar; the possibility to integrate these ISO's is strong. These standards can be implemented either individually or with each other.

LINK WITH OTHER ENVIRONMENTAL MANAGEMENT STANDARDS

Apart from the ISO 14001, other well-known standards relating to environmental management include:

- EMAS – Eco Management and Audit scheme
- ISO 50001 – Energy Management
- ISO 18601 - Packaging and the Environment
- ISO 29001 – Management for Oil and Gas
- British Standards Institute: BS 8555
- SSAE-16: Statement on Standards for Attestation Engagement

LINK WITH ISO 9001

If an organization is interested in combining management systems, for example a Quality Management System (QMS) with an Environmental Management System EMS; it is possible if ISO 9001 (QMS) and ISO 14001 (EMS) are implemented simultaneously, or if the QMS is implemented before the EMS.

If an organization already possesses an ISO 9001 certification, it is beneficial to know that there are many common requirements between ISO 9001 and ISO 14001, which do not need to be repeated when you combine the two.

The table below briefly describes the similarities of the clauses between these two standards:

ISO 9001	Clause of the Standard:	ISO 14001
4.2.3	Document Control	4.4.5
4.2.4	Records	4.5.4
5.5.1	Responsability and Authority	4.4.1
5.6	Management Review	4.6
6.2.2	Training, Competency, Awareness	4.4.2
8.2.2	Internal Audit	4.5.5
8.5.2	Corrective and Preventive Actions	4.5.3
6.3-6.4	Infrastructure, Work Environment	4.4.6

INTEGRATION WITH OTHER MANAGEMENT SYSTEMS

The general requirements are ordinarily identified in every management system. These requirements assist in:

- determining and applying objectives according to the organization's habits and needs;
- upholding the objectives based on strong management commitment by monitoring and reviewing;
- documenting pertinent management system processes;
- regular 'health-checks' via internal or external audits; and
- gaining benefits through continual improvement as achieved by a regular management review.

In addition, the table below presents the general requirements of several standards, which also serves as a comparing tool between an EMS and other management systems. This will authorize the organization to envision "combined audits" in order to achieve their compliance goals with adequate effort and budget.

Requirements	ISO 14001:2004	ISO 9001:2008	ISO 20000:2011	ISO 22301:2012	ISO 27001:2005
Objectives of the management system	4.3.3	5.4.1	4.5.2	6.5	4.2.1
Policy of the management system	4.2	5.3	4.1.2	5.3	4.2.1
Management commitment	4.4.1	5.1	4.1	5.2	5
Documentation requirements	4.4	4.2	4.3	7.5	4.3
Internal audit	4.5.5	8.2.2	4.5.4.2	9.2	5
Continual improvement	4.5.3	8.5.1	4.5.5	10	8
Management Review	4.6	5.6	4.5.4.3	9.3	7

ENVIRONMENTAL MANAGEMENT SYSTEM - THE BUSINESS BENEFITS

ISO 14001 was developed mainly to assist companies with a practice based framework for better management control. In addition to improvements in performance, organizations can gain a number of business benefits, including higher conformance with legislative and regulatory requirements and improved public image.

Reduction of environmental risks	Environmental protection	Effectiveness and efficiency	Better understanding of environmental performance
Cost reduction	Increased accountability	Increased reputation and brand	Confidence of clients
Competitive advantage	Legal compliance	Regulatory compliance	Contract compliance

The adoption of an effective environmental management system within an organization will have benefits in a number of areas, examples of which include:

1. Identification of cost savings with emphasis on resource, waste and energy management;
2. Effective and efficient management of environmental risks;
3. Demonstrable environmental commitment to stakeholders;
4. Lowering the risk of losing investors and customers;
5. Increasing the reputation of the organization in the community and beyond;
6. Increasing the opportunities to access new markets;
7. Reduction of costs related to insurance;
8. Compliance to national, regional and international laws and regulations;
9. Building trustful relationships with local and national authorities;
10. Usage of the ISO 14001 as a marketing tool;
11. Resource conservation; and
12. Positioning the organization as an environmental leader.

IMPLEMENTATION OF AN EMS WITH IMS2 METHODOLOGY

Considering the well documented benefits of implementing an Environmental Management System based on ISO 14001, makes the proposal easier to decide on.

Most companies now realize that it is not sufficient to implement a generic, "one size fits all" environmental plan. For an effective response, with respect to maintaining the environmental management system, such a plan must be customized to fit to a company. A more difficult task is the compilation of an implementation plan that balances the requirements of the standard, the business needs and the certification deadline.

There is no single blueprint for implementing ISO 14001 that will work for every company, but there are some common steps that will allow you to balance the frequent conflicting requirements and prepare you for a successful certification audit.

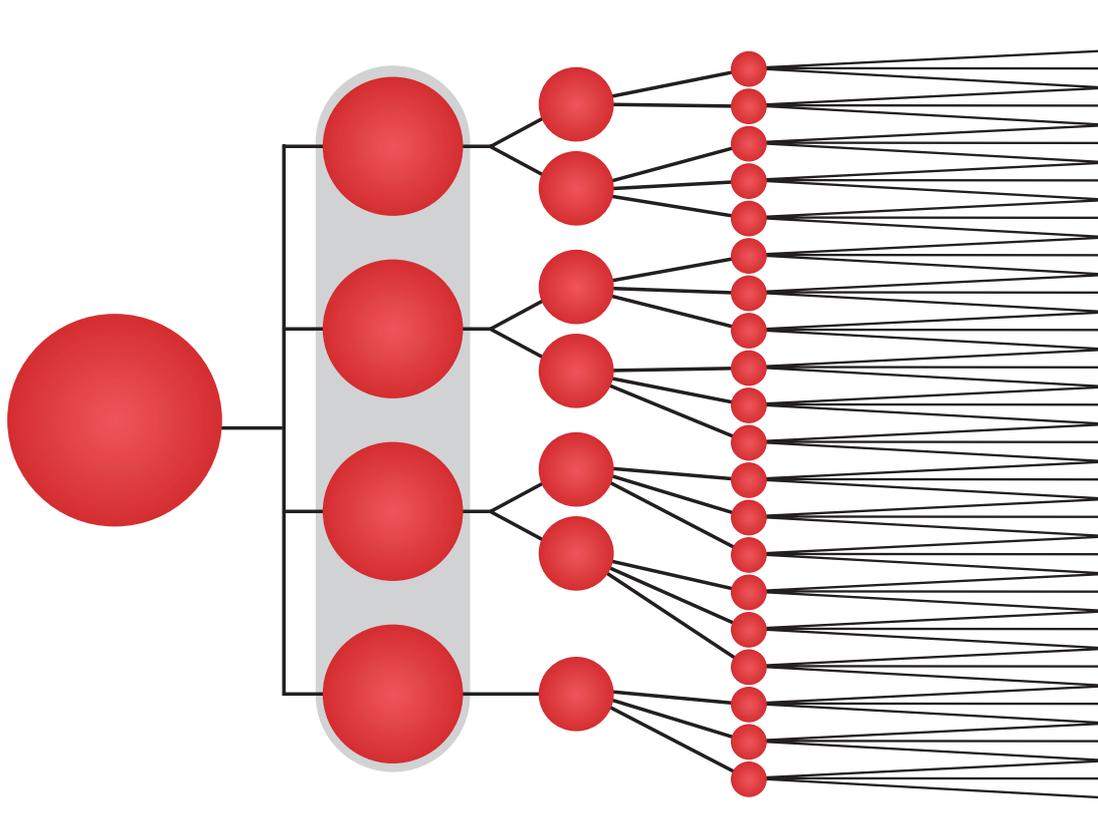
PECB has developed a methodology (please see example below) for implementing a management system; the "Integrated Implementation Methodology for Management Systems and Standards (IMS2)", and it is based on applicable best practices. This methodology is based on the guidelines of ISO standards and also meets the requirements of ISO 14001.

1. Plan	2. Do	3. Check	4. Act	
1.1 Initiating the EMS	2.1 Resources, Roles, Responsibility,	3.1 Monitoring, Measurement, Analysis and Evaluation	4.1 Treatment of Non-conformities	
1.2 Understanding the organization	2.2 Document Management		4.2 Continual Improvement	
1.3 Analyze the Existing System	2.3 Design of Controls and Procedures		3.2 Evaluation of Compliance	
1.4 Leadership and Project Approval	2.4 Communication		3.3 Internal Audit	
1.5 Scope	2.5 Awareness and Training	3.4 Management Review		
1.6 Environmental Policy	2.6 Operational Controls			
1.7 Environmental Policy	2.7 Emergency Preparedness			
1.8 Objectives, Targets and Programs				

IMS2 is based on the PDCA cycle which is divided into four phases: Plan, Do, Check and Act. Each phase has between 2 and 8 steps for a total of 21 steps. In turn, these steps are divided into 101 activities and tasks. This 'Practical Guide' considers the key phases of the implementation project from the starting point to the finishing point and suggests the appropriate 'best practice' for each one, while directing you to further helpful resources as you embark on your ISO 14001 journey.

The sequence of steps can be changed (inversion, merge). For example, the implementation of the management procedure or documented information can be done before the understanding of the organization. Many processes are iterative because of the need for progressive development throughout the implementation project; for example, communication and training.

By following a structured and effective methodology, an organization can be sure it covers all minimum requirements for the implementation of a management system. Whatever methodology used, the organization must adapt it to its particular context (requirements, size of the organization, scope, objectives, etc...) and not apply it like a cookbook.





CERTIFICATION OF ORGANIZATIONS

The following common processes for an organization that wishes to be certified against ISO 14001 are:

1.Implementation of the management system: Before being audited, a management system must be in operation for some time. Usually, the minimum time required by the certification bodies is 3 months.

2.Internal audit and review by top management: Before a management system can be certified, it must have had at least one internal audit report and one management review.

3.Selection of the certification body (registrar): Each organization can select the certification body (registrar) of its choice.

4.Pre-assessment audit (optional): An organization can choose to perform a pre-audit to identify any possible gap between its current management system and the requirements of the standard.

5.Stage 1 audit: A conformity review of the design of the management system. The main objective is to verify that the management system is designed to meet the requirements of the standard(s) and the objectives of the organization. It is recommended that at least some portion of the Stage 1 audit should be performed on-site at the organization's premises.

6.Stage 2 audit (On-site visit): The Stage 2 audit objective is to evaluate whether the declared management system conforms to all requirements of the standard is actually being implemented in the organization and can support the organization in achieving its objectives. Stage 2 takes place at the site(s) of the organization's sites(s) where the management system is implemented.

7.Follow-up audit (optional): If the auditee has non-conformities that require additional audit before being certified, the auditor will perform a follow-up visit to validate only the action plans linked to the non-conformities (usually one day).

8.Confirmation of registration: If the organization is compliant with the conditions of the standard, the Registrar confirms the registration and publishes the certificate.

9.Continual improvement and surveillance audits: Once an organization is registered, surveillance activities are conducted by the Certification Body to ensure that the management system still complies with the standard. The surveillance activities must include on-site visits (at least 1/year) that allow verifying the conformity of the certified client's management system and can also include: investigations following a complaint, review of a website, a written request for follow-up, etc.

TRAINING AND CERTIFICATIONS OF PROFESSIONALS

PECB has created a training roadmap and personnel certification schemes that is strongly recommended for implementers and auditors of an organization that wish to get certified against ISO 14001. Whereas certification of organizations is a vital component of the environmental management field as it provides evidence that organizations have developed standardized processes based on best practices. Certifications of individuals serve as documented evidence of professional competencies and experience for/of those individuals that have attended one of the related courses and exams.

It serves to demonstrate that a certified professional holds defined competencies based on best practices. It also allows organizations to make intelligent choices of employee selection or services based on the competencies that are represented by the certification designation. Finally, it provides incentives to the professional to constantly improve his/her skills and knowledge and serves as a tool for employers to ensure that training and awareness have been effective.

PECB training courses are offered globally through a network of authorized training providers. They are available in several languages and include introduction, foundation, implementer and auditor courses.

The table below gives a short description relating PECB's official training courses for information security management system based on ISO 14001.

Training title	Short description	Who should attend?
ISO 14001 Introduction	<ul style="list-style-type: none"> One day training Introduction to concepts management and implementation of a QMS Do not lead to certification 	<ul style="list-style-type: none"> Environmental managers or consultants Members of an Environmental team Anyone asked with developing and implementing an environmental management system Auditor
ISO 14001 Foundation	<ul style="list-style-type: none"> A two days training Become familiar with best practices for implementation and management of QMS One hour exam 	<ul style="list-style-type: none"> EMS managers and/or consultants Staff with project management or change management responsibilities Staff involved in EMS Legal representatives Auditors
ISO 14001 Lead Implementer	<ul style="list-style-type: none"> A five days training Manage the implementation and a management of a QMS Three hours exam 	<ul style="list-style-type: none"> Environmental managers or consultants Persons responsible for the Environmental conformity in an organization Members of an Environmental team Environmental expert advisors
ISO 14001 Lead Auditor	<ul style="list-style-type: none"> A five days training Manage the audit of a QMS Three hours exam 	<ul style="list-style-type: none"> Internal auditors Auditors Quality managers and/or consultants Persons responsible for Environmental conformity in an organization Environmental Management advisors Experts wanting to prepare for an Environmental audit function

Although a specified set of courses or curriculum of study is not required as part of the certification process, the completion of a recognized PECB course or program of study will significantly enhance your chance of passing a PECB certification examination. The list of approved organizations that offer PECB official training sessions is found on our website: www.pecb.com.

CHOOSING THE RIGHT CERTIFICATION

The ISO 14001 Foundation certification is a professional certification for professionals needing to have an overall understanding of the ISO 14001 standard and its requirements.

The ISO 14001 Lead Implementer certifications are professional certifications for professionals needing to implement an EMS and, in case of the ISO 14001 Lead Implementer Certification, needing to manage an implementation project.

The ISO 14001 Auditor certifications are credentials for professionals needing to audit an EMS and, in case of the "ISO 14001 Lead Auditor" Certification, needing to manage a team of auditors.

The ISO 14001 Master certification is a professional certification for professionals needing to implement an EMS and to master the audit techniques and manage (or be part of) audit teams and audit program.

Based on your overall professional experience and acquired qualifications, you will be granted one or more of these certifications based on projects or audits activities you have performed in the past, or you are currently working on.

Certification	Exam	Professional experience	Audit experience	Project experience
Foundation	Foundation Exam	None	None	None
Provisional Implementer	Lead Implementer Exam	None	None	None
Implementer	Lead Implementer Exam	Two years One year of work experience in the field of certification	None	Project activities totaling 200 hours
Lead Implementer	Lead Implementer Exam	Five years Two years of work experience in the field of certification	None	Project activities totaling 300 hours
Provisional Auditor	Lead Auditor Exam	None	None	None
Auditor	Lead Auditor Exam	Two years One year of work experience in the field of certification	Audit activities totaling 200 hours	None
Lead Auditor	Lead Auditor Exam	Five years Two years of work experience in the field of certification	Audit activities totaling 300 hours	None
Master	Lead Auditor Exam Lead Implementer Exam	Ten years Two years of work experience in the field of certification	Audit activities totaling 500 hours	Project activities totaling 500 hours

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