TITLE OF THE PROJECT: OPTIMAGRID SOE2/P2/E322

GT 3: Implementation of micro-grids with high penetration of renewable energies

DELIVERABLE 12: Energy certification and labelling for industry in the SUDOE area

Summary

The present study covers the state-of-the-art of a wide range of environmental and energy labels as well as Energy Legislation at national and EU level.

The document detail several energy and environmental standards and certification from different countries. It was found that the globally recognized standard, ISO 50001, is central for Energy Certification.

Despite the plethora of Energy labels, there is not in Europe any label that integrates Energy Management, Energy Efficiency and Renewable Energy, like there is in the US, with labels such as Energy Star or Superior Energy Performance.

The document also summarizes the national energy certification regulation for France, Portugal and Spain cases. Only Portuguese legislation has specific terms of reference of the scope of energy certification in Industry.

A road map or simple guide is presented, focus in energy performance and basic steps for energy management system certification.

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1. Introduction

This document was produced for the European project Optimagrid work package GT3, by the project team of Instituto Superior Técnico in collaboration with João Saraiva and Miguel Marques da Silva, energy consultants.

With increasing concerns regarding energy use, energy certification and labelling has become more and more common, and a decisive factor for consumers' final decision, especially regarding domestic equipment such as white and brown appliances, information technologies (IT), and to a lesser extent, buildings.

From an Industrial perspective, side by side with the industrial's interest in developing low energy products to gain and keep market share in increasingly competitive markets, the energy consumption associated with the manufacturing process is obviously a concern. Regular energy audits and energy optimization at the factories and industrial sites are becoming relatively common. The increasing attention from the general public for the environmental/carbon impact of products, creates a window of opportunity to seek some form of energy certification or labelling for industrial sites, often fuelled by the Industry's own concern of cutting energy costs and guaranteeing security of supply.

The following document presents a brief state-of-the-art of energy and environmental standards as well as international energy related labels. It aims to develop a basis for industrial sector companies to obtain energy certification based on energy efficiency and renewable energy integration (including CHP). The certification process seeks to promote a distinctive feature when compared to competitors in the same industries.

Each scheme was analysed on the basis of the structure indicated below (Figure 1):

Description: brief introdution

Institution in charge: name of the organizaion

Scheme link: URL for the scheme

Logo: graphical identification

Origin and history: Information about the beginning and evolution

Certification/Label Structure

Objectives: the basic concerns

Facts and Figures: statistical information

Implementation structure: multiorganizational unit of analysis

Requirements & criteria: list of the principal terms of reference

External audit/certification: datails about scheme and

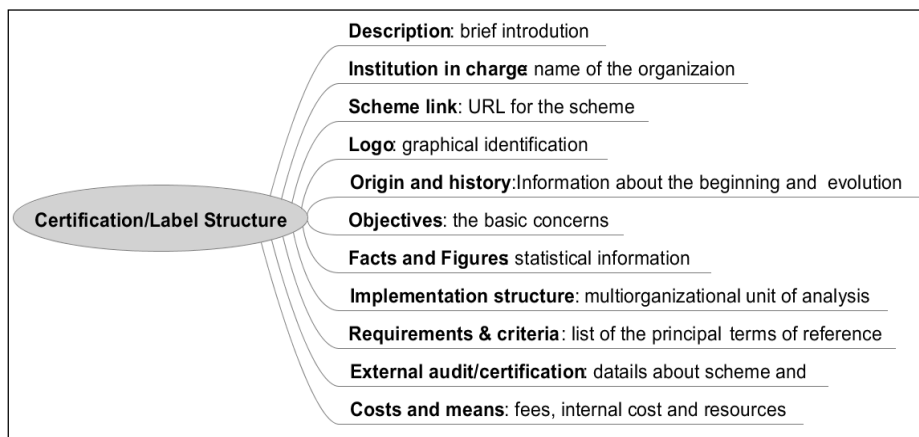**Costs and means**: fees, internal cost and resources

FIGURE 1 – STRUCTURE OF THE ANALYSIS TEMPLATE

Despite the extensive list of energy and environmental certification and labels described in this document, it does not represent the totality of the vast number of existing environmental and energy certification schemes.

Although environmental issues tend to cover a wide range of topics such as waste, noise, air emissions, effluents as well as energy, this study is more focused on an energy based environmental certification.

Companies are basically required to comply with mandatory national law. Beyond that, there is a quantity of voluntary commitments towards energy that have either regional or global recognition.

In order to comply with the basic legal requirements, it is good practice that companies set internal requirements, frequently based on existing labels, but with the flexibility to tailor-made label criteria according to specific needs.

There are also several national and international organizations that promote specific standards and certifications for energy and environmental themes. Internationally, the main standards entity is the International Organization for Standardization (ISO). Most national standards organizations ultimately adopt, for their country, the standards developed by ISO.

2. Labels, certification and legislation summary

The present section is a summary of labels, certification schemes and legislation that are detailed further on in this report.

The main criteria of this selection were to choose existing procedures that could be adopted in industrial sites. It was decided to differentiate these procedures into Certification Schemes, Labels and Legislation.

Certification Schemes are meant to cover management systems such as communicating energy efficiency reductions or green energy incorporated in the industrial process but they do not address specific "end-results". Typically, the scheme refers to ISO standards such as the 50001 and 14001, where companies develop a management system based on the appropriate and recognized international norms, and later have their management system certified by an external certification body, usually an independent private company. A detailed analysis of each certification scheme is made in section 3.

Labels are meant to differentiate products or industrial sites by allowing an external communication of specific results, either by addressing a commitment to reduce energy used in the process, integrating renewables, or simply by demonstrating the energy efficiency of the process, when compared, for example, with standard specific energy consumption for similar products. A detailed analysis of each label is made in section 4.

Finally, it was decided to add Compulsory Legislation addressing energy certification, since they often integrate in a fully regulated environment, the same principles and objectives as voluntary certification schemes and labels, namely energy management systems, external (often confidential) communication of specific consumptions, energy reduction commitments and others. Section 5 will present the detail analysis for energy certification legislation.

TABLE 1 – LABELS AND CERTIFICATIONS IN THE FIELD OF OR RELATED TO ENERGY APPLICABLE TO INDUSTRY

Certification/Label / Legislation	Institution	Description	Available Since	Geographical scope	Target group	Size of target companies
ISO 50001:2011 Energy management systems -- Requirements with guidance for use	International Organization for Standardization	http://www.iso.org/iso/home/standards/management-standards/iso50001.htm Specifies requirements for establishing, implementing, maintaining and improving an energy management system, whose purpose is to enable an organization to follow a systematic approach in achieving continual improvement of energy performance, including energy efficiency, energy use and consumption.	2011	Global	All sectors	All sizes
ISO 14001:2004 Environmental management systems -- Requirements with guidance for use	International Organization for Standardization	http://www.iso.org/iso/home/standards/management-standards/iso14000.htm Specifies requirements for an environmental management system to enable an organization to develop and implement a policy and objectives which take into account legal requirements and other requirements to which the organization subscribes, and information about significant environmental aspects. It applies to those environmental aspects that the organization identifies as those which it can control and those which it can influence. It does not itself state specific environmental performance criteria.	1996	Global	All sectors	All sizes
ISO 14040:2006 Environmental management -- Life cycle assessment -- Principles and framework	International Organization for Standardization	http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=37456 Describes the principles and framework for life cycle assessment (LCA) including: definition of the goal and scope of the LCA, the life cycle inventory analysis (LCI) phase, the life cycle impact assessment (LCIA) phase, the life cycle interpretation phase, reporting and critical review of the LCA, limitations of the LCA, the relationship between the LCA phases, and conditions for use of value choices and optional elements.	1997	Global	All sectors	All sizes
ISO 14044:2006 Environmental management -- Life cycle assessment -- Requirements and guidelines	International Organization for Standardization	http://www.iso.org/iso/catalogue_detail?csnumber=38498 ISO 14044:2006 specifies requirements and provides guidelines for life cycle assessment (LCA) including: definition of the goal and scope of the LCA, the life cycle inventory analysis (LCI) phase, the life cycle impact assessment (LCIA) phase, the life cycle interpretation phase, reporting and critical review of the LCA, limitations of the LCA, relationship between the LCA phases, and conditions for use of value choices and optional elements.	2006	Global	All sectors	All sizes
EMAS – European Eco-Management and	European Union	http://ec.europa.eu/environment/emas/index_en.htm Management tool for companies and other organisations to evaluate, report and	1995	European Union and European	All sectors	All sizes

Audit Scheme		improve their environmental performance. The scheme has been available for participation by companies since 1995 and was originally restricted to companies in industrial sectors.		Economic Area		
EU Ecolabel	European Union	http://ec.europa.eu/environment/ecolabel/index_en.htm Voluntary scheme to encourage businesses to market products and services that are kinder to the environment. Products and services awarded the Ecolabel carry the flower logo, allowing consumers - including public and private purchasers - to identify them easily. Today the EU Ecolabel covers a wide range of products and services, with further groups being continuously added. Product groups include cleaning products, appliances, paper products, textile and home and garden products, lubricants and services such as tourist accommodation.	1992	Products or services supplied for distribution, consumption or use in the European Economic Area market	All sectors	All sizes
Superior Energy Performance Program	Department of Energy (USA)	http://www.superiorenergyperformance.net/index.html Certification program that provides industrial facilities with a roadmap for achieving continual improvement in energy efficiency while maintaining competitiveness. The program will provide a transparent, globally accepted system for verifying energy performance improvements and management practices.	2013	United States and Canada	Industrial Sites	Not defined
Energy Star – Buildings and Plant	U.S. Environmental Protection Agency and the U.S. Department of Energy helping	http://www.energystar.gov/index.cfm?c=about.ab_index ENERGY STAR is a joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy helping us all save money and protect the environment through energy efficient products and practices. Results are already adding up. Americans, with the help of ENERGY STAR, saved enough energy in 2010 alone to avoid greenhouse gas emissions equivalent to those from 33 million cars — all while saving nearly $18 billion on their utility bills.	1996	United States and Canada	Industrial Sites and buildings	Not defined
Environmental Warrant of Fitness Site Standard	EWOF Limited/NZ	http://www.ewof.co.nz Standard developed to provide recognition for small, single-site businesses, increase the uptake of formal environmental management participation and provide consumers and the community with some reassurance about the site based activities of businesses	-	New Zeland / International	All sectors	small, single-site businesses
WindMade	WindMade/BE	http://www.windmade.org/ It will be a consumer label identifying products and companies made with wind energy. WindMade™ will be dedicated to increasing corporate investments in wind power by informing consumers about companies' use of wind energy, and increasing demand for products that embrace this clean and renewable energy source. It is not yet available.	2011	World wide	Companies, Products and Events	Not defined
EKOenergy	EKOenergy/FI	http://www.ekoenergy.org International ecolabel for electricity based in Finland. The label has started a process leading to a European wide launching in 2012. EKOenergy is always	2013	European Union	Companies, Private consumers	Not defined

		more than "green energy". In addition to being 100% renewable it also satisfies additional sustainability criteria. The EKOenergy label pushes energy production in the direction preferred by electricity consumers from private households to big multinational companies.				
Green-e Energy	Center for Resource Solutions/USA	http://www.green-e.org/getcert_re.shtml Voluntary certification program for renewable energy. For over a decade, Green-e Energy has been certifying renewable energy that meets environmental and consumer protection standards that it developed in conjunction with leading environmental, energy and policy organizations. Green-e Energy also requires that sellers of certified renewable energy disclose clear and useful information to potential customers, allowing consumers to make informed choices.	2008	United States and Canada	Companies,Private consumers	Not defined
TÜV EE01/EE02	TÜV SÜD/DE	http://www.tuev-sued.de/plants-buildings-technical-facilities/fields-of-engineering/environmental-engineering/energy-certification/certification-criteria?dtree=1 Certify electricity generated 100 % from renewable energy sources (01) or 100 % water power (02). Requirements for EE01 are: electricity generated 100 % from renewable energy sources; at least 25 % has to be produced in new plants; the energy sources should be identified and clearly indicated. Requirements for EE02 are: electricity generated 100 % from water plants; generation and consumption at the same time; expansion of capacity is optional.	2011	World wide	Green Energy Producers	Not defined
European Union Emissions Trading Scheme	European Parliament and Council	http://ec.europa.eu/clima/policies/ets/index_en.htm The EU emissions trading system (EU ETS) is a part of the European Union's policy to combat climate change, as part of its commitment for the Kyoto Protocol. The EU ETS covers more than 11,000 power stations and industrial plants in 31 countries, as well as airlines.	2005	EU, Croatia, Iceland, Liechtenstein and Norway	Power plants, heavy industry and Aviation	Variable, depending in each countries' legislation
Energy certification: Grenelle II (White Certificates)	French Government	http://www.developpement-durable.gouv.fr/-Certificats-d-economies-d-energie,188-.html Grenelle II is not a formal detailed legislation, but the current French framework for energy and environmental efficiency. There is not compulsory legislation for the Industry, despite that Public Buildings (State Owned) and Tertiary Buildings subjected to rent or sale should be certificated, and therefore subjected to a technical (energy) audit.	2006	France	Utility Companies and Fuel Vendors (transport sector)	Variable - defined in French Legislation
SCE	ADENE (Portugal)	http://www.adene.pt/pt-PT/Subportais/SCE/Paginas/default.aspx Building energy certification	2006	Portugal	Buildings	New and existing buildings
SGIE	ADENE (Portugal)	http://www.adene.pt/pt-pt/SubPortais/SGCIE/Paginas/Homepage.aspx Intensive Energy consume management system	2006	Portugal	Industrial	>500 Tep
RD47/2007	IDAE (Spain)	http://www.idae.es/index.php/id.25/mod.pags/mem.detalle Building energy certification	2007	Spain	Buildings	New buildings

3. Certifications

Four certification schemes are covered in this section, three of them being ISO standards and the fourth being the EU's voluntary EMAS scheme (Eco-Management and Audit Scheme).

3.1. ISO 50001:2011

Description
The ISO 50001 is a new voluntary International Standard that establishes a framework for large and small industrial plants and commercial, institutional and government facilities to improve the way they manage energy. It supersedes the European and North American norms EN 16001 and ANSE/MSE 2000

Institution in charge
International Organization for Standardization (ISO)

Scheme link
http://www.iso.org/iso/home/standards/management-standards/iso50001.htm

Logo
ISO standards logo depends on the external certification body, recognized by ISO, and is not mandatory.

Origin and history
The actual version of the ISO 50001 was published in mid-June 2011 and it was based not only on other ISO management systems, but also on norms such as the EN 16001 or ANSE/MSE 2000

Objectives

The principal objectives of ISO 50001 is to help organizations save money as well as helping to conserve resources and tackle climate change. The ISO 50001 acts as a guide on how an organization can set up an effective Energy Management System that is systematic and comparable with other organization's EMS.

The Energy Management System model established by the ISO 50001 is a continuous improvement cyclic process of the organization's energy performance, where it reviews and evaluates periodically their Management System, in order to identify opportunities for improvement (Plan, Do, Check, Act).

In brief the basic concerns of ISO 50001 are similar with other ISO management systems:

1. Conventional energy is a limited resource, and thus its consumption must be quantified, understood and reduced, or eventually be met from more sustainable sources;
2. Instead of fulfilling exclusively legislation and regulation of Energy Efficiency/ Management, companies can be self-regulated;
3. The implementation of a management system encourages the improvement of environmental and economic performance;
4. Audits by accredited external agents encourages adherence to programmatic obligations.

Facts and Figures

Up to the end of December 2011, at least 461 ISO 50001:2011 certificates had been issued in 32 countries and economies.

France: 3
Portugal: 1
Spain: 95

The top three countries for the total number of certificates were Spain, Romania and Sweden.

Implementation structure

The ISO is responsible for the standard scheme while an external certification body, recognized by ISO, is in charge of the certification.

The external certification body has experts (accredited auditors) qualified to issue an ISO 50001 certification audits.

Requirements & criteria

There are no specific criteria to reach the ISO 50001 certification. Instead, the management system must fulfil the following requirements:

Top management commitment: commitment of senior management is required.

Energy policy: the organization must have a policy, or commitment statement, approved by the top management. This is generally a short statement where the compliance with legal and other requirements, energy management principles, and continual improvement is established. The policy provides a framework for reviewing energy use objectives and targets. This policy must be documented, implemented, and maintained.

Legal requirements: need for a procedure that demonstrates how the organization identifies and has access to the energy related legislation that are relevant to its operations and activities, so that the organization can ensure that they are taken into account in the Management System.

Objectives and implementation program: planning of the Energy Management Program must include achievable and feasible objectives. The objectives and targets need to exist at whatever functions and level of the organization, and be measurable. Management programs (MPs) are the detailed plans and programs explaining how the objectives and targets will be accomplished. Fulfilment of the objective will take into account the means, personal, trainees and responsibilities of the establishment.

Structure and Responsibility: roles, responsibilities, and authorities must be defined, documented and communicated as appropriate throughout the organization. The organization must denote a specific Energy Manager who is responsible and oversees the MS and report to management on its operation. This person(s) ensures that the MS is established, implemented and maintained consistent with ISO 50001.

Training and competence: the organization must provide training to employees to enable them to understand and collaborate with the MS. Competence is ensured through appropriate education, training, and/or experience.

Communication: public procedures are required for internal and external communications to inform how the organization's environmental policy should be communicated.

Documentation: includes energy policy, objectives, plans and targets, a definition of the scope of the MS, and other main elements. Documents control and procedure reference is required.

Verification and corrective action: the energy management plan must be reviewed periodically according to the applicable energy legislation, through a traceable and monitorable system. Improvement is required periodically.

Internal Audit: the system must provide for internal audits. This procedure could include methodologies, schedules, checklists and forms, and processes used to conduct the audits. Auditors need to be selected such that it ensures objectivity and impartiality of the audit process.

Management review: periodically, top management will review the MS to ensure it is operating as planned, and is suitable, adequate, and effective through the involvement of the management in the assessment and audit of the MS.

ISO 50001 does not require predefined levels of energy performance, requiring only that the organization undertakes to continually improve on its own.

External audit/certification

For certification an external audit is required, to be conducted by an independent external auditor, accredited by an ISO recognized certification body.

Costs and means
Costs are subject to market rates, and thus are highly variable. It will depend mostly on the complexity of the organizations, so prices could vary between €5.000 and € 100.000.

3.2. ISO 14001:2004

Description
ISO 14001:2004 is part of a series of international environmental standards (ISO14000) developed by the ISO. This norm specifies requirements for an environmental management system to enable an organization to develop and implement a policy and objectives which take into account legal requirements and other requirements to which the organization subscribes, and information about significant environmental aspects. It applies to those environmental aspects that the organization identifies as those which it can control and those which it can influence. It does not itself state specific environmental performance criteria.

Institution in charge
International Organization for Standardization (ISO)

Scheme link
http://www.iso.org/iso/home/standards/management-standards/iso14000.htm

Logo
ISO standards logo depends on the external certification body, recognized by ISO, and is not mandatory.

Origin and history
The ISO 14001 was initially created in 1993 by the Technical Committees TC 207 from ISO with the objective to develop international standards about the environment. The standard was initially published on 1996 (ISO 14001:1996).   A new and current standard version was published on 2004 (ISO 14001:2004). This new version aimed to achieve a clarification of the first edition of the environmental standard, permitting easier use and also better compatibility with the ISO 9001:2000.

Objectives

The principal objective of ISO 14001 is to guide an organization to set up an effective environmental management system (EMS).

The EMS model established by ISO 14001 is a continuous improvement cyclic process of the organization's environmental performance, where it reviews and evaluates periodically their EMS, in order to identify opportunities for improvement.

In brief the basic ideas of ISO 14001 are:

1. Pollution is a source of waste and must be reduced or eliminated;
2. Instead of fulfilling exclusively legislation and regulation of pollution control, companies can be self-regulated;
3. The implementation of a management system encourages the improvement of environmental performance;
4. Audits by accredited external agents encourages adherence to programmatic obligations.

Facts and Figures

Up to the end of December 2011, at least 267.457 ISO 14001:2004 certificates had been issued, in 158 countries.

France: 7771
Portugal: 836
Spain: 16341

The top three countries for the total number of certificates were China, Japan and Italy, while the top three for growth in the number of certificates in 2011 were China, Italy and France.

Implementation structure

The ISO is responsible for the standard scheme. ISO does not provide certification or conformity assessment.

An external certification body, recognized by ISO, is in charge of the certification.

The external certification body has experts (accredited auditors) qualified to issue an ISO 14001 certification audits.

Requirements & criteria

There are no specific criteria to reach the ISO 14001 certification. Instead, the EMS must fulfil general requirements:

Top management commitment: commitment of senior management is required.

Environmental policy: The organization must have a policy, or commitment statement, approved by the top management. This is generally a short statement where compliance with legal and other

requirements, prevention of pollution, and continual improvement is established. The policy provides a framework for reviewing environmental objectives and targets. This policy must be documented, implemented, and maintained.

Legal requirements: need for a procedure that demonstrates how the organization identifies and has access to the energy related legislation that are relevant to its operations and activities, so that the organization can ensure that they are taken into account in the Management System.

Objectives and implementation program: planning of the environmental management program must include achievable and feasible objectives. The objectives and targets need to exist at whatever functions and levels of the organization, and be measurable. Management programs (MPs) are the detailed plans and programs explaining how the objectives and targets will be accomplished.

Structure and Responsibility: roles, responsibilities, and authorities must be defined, documented and communicated as appropriate throughout the organization. The organization must denote a specific environmental manager who is responsible to oversee the EMS and report to management on its operation. This person(s) ensures that the EMS is established, implemented and maintained consistent with ISO 14001.

Training and competence: the organization must provide training to employees to enable them to understand and collaborate with the EMS. Competence is ensured through appropriate education, training, and/or experience.

Communication: public procedures are required for internal and external communications to inform how the organization's environmental policy should be communicated.

Documentation: includes environmental policy, objectives, plans and targets, a definition of the scope of the EMS, and other main elements. Documents control and procedure reference is required.

Verification and corrective action: the environmental plan must be reviewed periodically according with the environmental legislation, through a traceable and monitorable system. Improvement is required periodically.

Internal Audit: the system must provide for internal audits. This procedure could include methodologies, schedules, checklists and forms, and processes used to conduct the audits. Auditors need to be selected such that it ensures objectivity and impartiality of the audit process.

Management review: periodically, top management will review the EMS to ensure that it is operating as planned, and is suitable, adequate, and effective through the involvement of the management in the assessment and audit of the EMS.

ISO 14001 does not require predefined levels of environmental performance, requiring only that the organization undertakes to seek to continually improve of its own.

External audit/certification

For certification an external audit is required to be conducted by an independent external auditor, accredited by a ISO recognized certification body

The audit period is 3 years.

An ISO 14001:2004 registration means that the auditing body records the certification in its client register.

Costs and means

Relevant costs are: development, implementation, certification and maintaining the ISO 14001.

Principal development, implementation, certification costs (indicative values):

Organization Size (Number of Employees)	**External Cost**	**Internal Costs**	**TOTAL**
Small (<100)	17'000 €	13'000 €	30'000 €
Medium (101-500)	12'000 €	22'000 €	34'000 €
Large (>500)	25'000 €	31'000 €	56'000 €

Source: Yiridoe et al. (2003)

Internal cost (administrative, training)

External (consulting, external auditors and certification bodies)

3.3.   ISO 14040:2006 and ISO 14044:2006

Description
ISO 14040 is part of a series of international environmental standards (ISO14000) developed by the ISO. It describes the principles and framework for life cycle assessment (LCA) including: definition of the goal and scope of the LCA, the life cycle inventory analysis (LCI) phase, the life cycle impact assessment (LCIA) phase, the life cycle interpretation phase, reporting and critical review of the LCA, limitations of the LCA, the relationship between the LCA phases. ISO 14040:2006 covers life cycle assessment (LCA) studies and life cycle inventory (LCI) studies. It does not describe the LCA technique in detail, nor does it specify methodologies for the individual phases of the LC. ISO 14044:2006 Environmental management includes detailed requirements and guidelines are designed for the preparation of, conduct of, and critical review of life cycle inventory analysis (LCIA). It also provides guidance on the impact assessment phase of LCA and on the interpretation of LCA results, as well as the nature and quality of the data collected.

Institution in charge
International Organization for Standardization (ISO)

Scheme link
http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=37456 http://www.iso.org/iso/catalogue_detail?csnumber=38498

Logo
ISO standards logo depends on the external certification body, recognized by ISO, and is not mandatory.

Origin and history
The first ISO 14040 was published in 1997, and complemented by several other stands ISO 14040:1997, ISO 14041:1999, ISO 14042:2000 and ISO 14043:2000. With the publication of the two new standards, ISO 14040 and ISO 14044, the existing four standards ISO 14040:1997, ISO 14041:1999, ISO 14042:2000 and ISO 14043:2000 are technically revised, cancelled and replaced.

Objectives

ISO 14040:2006 objectives
Compilation of inventory flows relevant system products

Evaluation of potential environmental impacts associated with flows

Results interpretation analysis of the stages of the inventory and impact assessment in relation to the objectives of the studies.

ISO 14044:2006 Standard covers two types of studies:
- Life Cycle Assessment studies (LCA studies)
- Life Cycle Inventory studies (LCI studies)

Life Cycle Assessment (LCA) is a structured, comprehensive and internationally standardised method. It quantifies all relevant emissions and resources consumed and the related environmental and health impacts and resource depletion issues that are associated with any goods or services ("products").

LCA objectives
- Definition of the objectives of the study
- Choice of the functional unit
- Delimitation of the system boundaries
- Data quality requirements

Life Cycle Interpretation (LCI): is a systematic technique to identify, quantify, check, and evaluate information from the results of the life cycle inventory and/or the life cycle impact assessment.

LCI objectives
- The results from the inventory analysis and impact assessment are summarized during the interpretation phase. It includes
- Identification of the strong and the weak points based on the results of the LCI and LCIA phases
- Meeting the goals set during the first stage
- Evaluation of the study considering completeness, sensitivity and consistency checks
- Conclusions, limitations and recommendations.

Facts and Numbers

Not available

Implementation structure

The ISO is responsible for the standard scheme while an external certification body, recognized by ISO, is in charge of the certification.

Methodological framework for LCA

There are four phases in an LCA study:

a) the goal and scope definition phase;
b) the inventory analysis phase: input/output data with regard to the system being studied. It involves collection of the data necessary to meet the goals of the defined study;
c) the impact assessment phase, provide additional information to help assess a product system's LCI results so as to better understand their environmental significance;
d) the interpretation phase: in which the results of an LCI or an LCIA, or both, are summarized and discussed as a basis for conclusions, recommendations and decision-making in accordance with the goal and scope definition.

The Study will be followed by:

Reporting: A reporting strategy is an integral part of an LCA. An effective report should address the different phases of the study under consideration. Report the results and conclusions of the LCA in an adequate form to the intended audience, addressing the data, methods and assumptions applied in the study, and the limitations thereof.

Critical review: The scope and type of critical review desired is defined in the scope phase of an LCA. The scope should identify why the critical review is being undertaken, what will be covered and to what level of detail, and who needs to be involved in the process.

Two review types are conducted:

- **Critical review by internal or external expert:** an expert independent of the LCA shall perform the review. The review statement, comments of the practitioner and any response to recommendations made by the reviewer shall be included in the LCA report.
- **Critical review by a panel of interested parties:** an external independent expert should be selected by the original study commissioner to act as chairperson of a review panel of at least three members.

Requirements & criteria

Requirements are present in ISO 14044 for the principles and framework to be used to conduct an LCA.

LCA studies shall include the goal and scope definition, inventory analysis, impact assessment and interpretation of results.

LCI studies shall include definition of the goal and scope, inventory analysis and interpretation of results. The requirements and recommendations of this International Standard, with the exception of those provisions regarding impact assessment, also apply to life cycle inventory studies.

An LCI study alone shall not be used for comparisons intended to be used in comparative assertions intended to be disclosed to the public.

ISO 14044 specifies requirements and provides guidelines for life cycle assessment (LCA) including:

- the goal and scope definition of the LCA,
- the life cycle inventory analysis (LCI) phase,
- the life cycle impact assessment (LCIA) phase,
- the life cycle interpretation phase,

- reporting and critical review of the LCA,
- limitations of the LCA,
- relationship between the LCA phases, and
- conditions for use of value choices and optional elements.

External audit/certification

External independent experts should be selected by the original study commissioner to act as chairperson of a review panel of at least three members.

Costs and means

Information not provided by responsible entity.

3.4. EMAS

Description
The Eco-Management and Audit Scheme (EMAS) is the EU's voluntary scheme designed for companies and other organizations committing themselves to evaluate, manage and improve their environmental performance. EMAS is a credible and robust environmental management system on the market, complementary to the requirements of the international standard for environmental management systems ISO/ EN ISO 14001. The European Commission is the implementing institution.

Institution in charge
European Union

Scheme link
http://ec.europa.eu/environment/emas/index_en.htm

Logo

Origin and history
The Council Regulation 1836/93 was adopted on 29 June 1993. It created the Eco-Management and Audit Scheme (EMAS) with a view to allow companies to voluntarily participate in an environmental management scheme. It is open to industrial sector companies operating in the European Union and the European Economic Area (EEA). Between 1993 and 1995 competent bodies and accreditation bodies were set up as structures for the implementation of the scheme.

Since 1995, companies have been able to participate in the scheme. It was originally restricted to companies in industrial sectors but widened its focus in 2001 and participation is now open to all economic sectors including public and private services.

In 2009 the EMAS Regulation was revised and modified for the second time. Regulation (EC) No 1221/2009 of the European Parliament and of the Council of 25 November 2009 on the voluntary participation by organizations in a Community eco-management and audit scheme (EMAS) was published on 22 December 2009 and entered into force on 11 January 2010.

Objectives

The objective of EMAS is to ensure continued improvement of the environmental performance of public and private organizations by addressing a number of key issues: the establishment of an environmental management system; the systematic, periodic and objective evaluation of this system; the provision of information on environmental performance and an open dialogue with the public and other stakeholders; active involvement of employees in the organization; and compliance with legal requirements.

Facts and Figures

Up to the end of June 2012, 8174 sites and 4581 organizations have the EMAS logo.

France: 26 sites and 26 organizations
Portugal: 101 sites and 66 organizations
Spain: 1568 sites and 1258 organizations

Implementation structure

The European Commission develops and supervises EMAS at EU level. All Member States are obliged to create national registration and verification schemes which allow a smooth implementation of EMAS at the national level. Most important actors on the national level are the EMAS Competent Bodies and the accreditation bodies.

The Competent Body is responsible for issuing registration numbers to organisations, collect fees and to respond to enquiries of national organizations.

The Accreditation Body is an independent, impartial institution or organization responsible for the accreditation and supervision of environmental verifiers and designated by the Member State.

Member States may use existing accreditation institutions, the EMAS Competent Body or designate any other appropriate body. Environmental verifiers are accredited organisations or EMAS experts that verify the organizations registering for EMAS.

Requirements & criteria

General requirements are define for EMAS:

Top management commitment: commitment of top management is required.

Environmental review: initial comprehensive analysis of the organization's activities, products and services and their environmental impact; cataloguing applicable environmental law, regulatory and other requirements, environmental aspects, criteria to assess identified aspects, environmental practices and procedures.

Environmental policy: the organization must commit itself to continuous improvement, preventing pollution, involvement of employees, and compliance with relevant legislation. The policy needs to be documented, publicly available, and reviewed on a regular basis.

Legal requirements: compliance with all the environmental legislation applicable. It is necessary to demonstrate legal compliance during the audit.

Objectives and implementation environment program: designed based on the environmental aspects identified during the environmental review. It serves to manage environmental aspects and to control pollution. The program should include environmental objectives and a plan that include activities, indicators, targets, timetables, and responsibilities.

Structure and Responsibility: a program coordinator must be nominated, who is responsible for the implementation of EMAS. Additionally, active employee participation in all steps of EMAS is required.

Training and competence: two specific points shall be addressed: **a baseline training** that covers the entire organization and **a specific technical and skills training:** for individuals and units that are responsible for activities or processes that may create significant environmental impacts.

Communication: three specific points shall be addressed: Procedures to facilitate internal communication with respect to the EMS, a system for receiving and responding to communication from external parties and a structure for determining whether or not the organization will communicate to external parties on its significant environmental aspects.

Documentation: key elements of the EMS need to be documented. This includes objectives and targets; the structure and responsibilities; EMS core elements and their interaction; documented procedures etc.. The description must reference the related documents.

Verification and corrective action: An internal audit needs to take place annually. Corrective action and continuous improvement are key elements of EMAS. Annual improvement is required, which means that the scheme acts as a stimulus for innovation.

Management review: periodically, top management will review the EMS to ensure it is operating as planned, and is suitable, adequate, and effective through the involvement of the management in the assessment and audit of the EMS. For this the management will collect the necessary information and evaluate the management system, addressing possible need for changes to policy, objectives and other elements of the EMS (records).

Environmental Report: environmental statement needs to be prepared, verified, published, and updated on an annual basis. It will include: a clear and succinct description of your organization and its activities; the environmental policy and a brief description of the EMS; environmental objectives, targets, program and relevant aspects description; summary data and information on your actual environmental performance.

External audit/certification

The audit can be completed internally or externally, however verification must be done externally.

The external audit period is 3 years.

An independent expert (accredited environmental verifier) examines the organization to see if all EMAS requirements are met. If all results are positive, the company's environmental statement is validated and sent to the national EMAS Competent Body. The company is then officially registered under EMAS.

Costs and means

The EMAS Small Organization Toolkit estimates costs at the following approximate amounts from the experience of organisations in northern European countries:

Organization Size (Number of Employees)	Cost
Very Small (<10)	10,000 €
Small (<50)	20,000 €
Medium (51-250)	35,000 €
Large (>250)	50,000 €

The following two categories of costs can be distinguished:

External costs: incurred by employing external expertise to support EMAS implementation and reporting. (External consultant, validation and verification fees, registration fees).

Internal costs: incurred by organization staff to implement, administer and report on EMAS. (Environmental review, development of environmental management system, internal audit, preparation of EMAS statement, internal staff training, attaching EMAS logo, modifications to IT systems, publication of environmental statement, other administrative related costs).

A significant part of internal costs is the internal resources required to implement the scheme.

Proficiencies or skills

EMAS needs time, knowledge, human resources and potentially external advice. External assistance can be useful for carrying out the steps of the system, such as the initial environmental review and identification of the significant environmental aspects of your company's activities and legal requirements.

4. Labels

This section covers a selection of eight labels established by a number of countries in the world.

4.1.   EU Ecolabel

Description
The EU Ecolabel is a voluntary scheme to encourage businesses to market products and services that are kinder to the environment. Products and services awarded the Ecolabel carry the flower logo, allowing consumers - including public and private purchasers - to identify them easily. Today the EU Ecolabel covers a wide range of products and services, with further groups being continuously added. Product groups include cleaning products, appliances, paper products, textile and home and garden products, lubricants and services such as tourist accommodation. The EU Ecolabel helps identify products and services that have a reduced environmental impact throughout their life cycle, from the extraction of raw material through to production, use and disposal. Recognized throughout Europe, EU Ecolabel is a voluntary label promoting environmental excellence.

Institution in charge
European Union

Scheme link
http://ec.europa.eu/environment/ecolabel/index_en.htm

Logo

Origin and history

The EU Ecolabel was launched in 1992 when the European Community decided to develop a Europe-wide voluntary environmental scheme that consumers could trust.

The EU Ecolabel scheme promotes the production and consumption of products that have a reduced environmental impact in comparison to existing products on the market. Because the scheme works on a European level, it goes beyond the pre-existing national ecolabels that are often only known within national borders.

Objectives

The European Eco-label distinguishes products that meet high standards of performance and environmental quality.

For manufacturers and retailers the European Eco-label gives added value to their products and competitive advantage in the growing market of greener goods and services.

For shoppers, it is a reliable token of environmental care.

To be awarded with it, products must pass rigorous compliance tests in a process verified by an independent, publicly accountable body.

The basic objective are:

● use less energy while performing as well as or better than other products;
● last longer through more durable design and availability of spare parts;
● are easier to recycle due to more thoughtful assembly and use of materials; and
● consume fewer natural resources (such as water and raw material).

When developing EU Ecolabel criteria for products, the focus is on the stages where the product has the highest environmental impact, and this differs from product to product.

Facts and Figures

By the end of 2011, more than 1,300 licenses had been awarded, and today, the EU Ecolabel can be found on more than 17,000 products. A license gives a company the right to use the EU Ecolabel logo for a specific product group.

The EU Ecolabel currently covers a huge range of products and services, all non-food and non-medical. Tissue paper and all-purpose cleaners each equate to around 10% of EU Ecolabel products, while indoor paints and varnishes make up nearly 14%. The largest product group is hard floor coverings, which total more than 33% of EU Ecolabel products.

Labels by country:

France: 3839
Portugal: 13
Spain: 599

Implementation structure

The **European Union Ecolabelling Board** (EUEB) is composed of the representatives of the Competent Bodies of the European Union, the Competent Bodies of Iceland, Liechtenstein and Norway and the representatives of the following organisations:

- European Environmental Bureau (EEB)
- Bureau Européen des Consommateurs (BEUC)
- European Confederation of Associations of Small- and Medium-Sized Enterprises (CEA-PME)
- Business Europe
- EUROCOOP
- European Association of Craft, Small- & Medium-Sized Enterprises (UEAPME)
- EUROCOMMERCE

The EUEB contributes to the development and revision of EU Ecolabel criteria and to any review of the implementation of the EU Ecolabel scheme. It also provides the Commission with advice and assistance in these areas and, in particular, issues recommendations on minimum environmental performance requirements.

The **European Commission** manages the scheme at the EU level to ensure that the Ecolabel Regulation is implemented correctly.

Even if the development or revision of EU Ecolabel criteria can be initiated and lead by parties other than the European Commission (states, Competent Bodies and other stakeholders), the Commission is in any case responsible for preparing the final draft of the criteria documents that have to take into account the comments from the EUEB. The Commission adopts EU Ecolabel criteria for each product group as "Commission decisions" after the Ecolabel Regulatory Committee supports the criteria by a qualified majority.

Competent Bodies are independent and impartial organisations designated by states of the European Economic Area within government ministries or outside the ministries. They are responsible for implementing the EU Ecolabel scheme at the national level and should be the first point of contact for any questions from applicants. They specifically assess applications and award the EU Ecolabel to products that meet the criteria set for them. As such, they are responsible for ensuring that the verification process is carried out in a consistent, neutral and reliable manner by a party independent from the operator being verified, based on international, European or national standards and procedures concerning bodies operating product-certification schemes.

The **EU Ecolabel Helpdesk** assists the European Commission with different tasks, such as developing news publications, gaining stakeholder support and soliciting aid for certain marketing activities. It also provides help to the public by email and phone regarding general questions about the EU Ecolabel.

Requirements & criteria

The EU Ecolabel covers a huge range of product groups, from major areas of manufacturing to tourist accommodation services.

Key experts, in consultation with main stakeholders, develop the criteria for each product group in order to decrease the main environmental impacts over the entire life cycle of the product. Because

the life cycle of every product and service is different, the criteria are tailored to address the unique characteristics of each product type.

Every four years on average, the criteria are revised to reflect technical innovation such as evolution of materials, production processes or in emission reduction and changes in the market. Because of this, customers can be sure that EU Ecolabel continues to stand for the highest environmental performance.

The criteria have been developed to ensure that the 10 to 20% most environmentally friendly products currently on the market can meet them. While the EU Ecolabel award is a realistic goal for producers, it ensures good performance and reduced environmental impact for consumers.

Basic procedure:

1. **Check if product is eligible:** Confirm if the product comes under one of the product groups included in the scheme, and then check the detailed criteria.

2. **Check if organization is eligible**. Manufacturers, importers and service providers can all apply for the Flower. Traders and retailers can also apply, but only for products marketed under their own brand names.

3. **Contact Competent Body**. Manufacturer, importer or retailer, must contact the national Competent Body (CB). CB is responsible for evaluating the application and awarding the EU Ecolabel. The CB can also give further information about fees schedule. The CB will provide assistance throughout the application process.

4. **Starting the application**: To get the EU Ecolabel licence, it is mandatory to apply using the online application tool.

5. **Collecting the Evidence**: In order to prove compliance to the criteria for the product group, need to provide a dossier made up of the declarations, documents, data sheets and test results.

6. **Submitting the Application**: Once the application is submitted online, a paper copy will need to be submitted to the relevant Competent Body. Within two months of receipt of an application, the Competent Body will assess the product against the criteria set for it. The competent body may also organize a visit or audit the manufacturing facility.

7. **Ecolabel awarded-Application approval**: If the product meets the criteria and the dossier is complete, the Competent Body will award the EU Ecolabel to the product by creating a contract. Once complete, the product can use the EU Ecolabel logo.

8. **Compliance monitoring**: the Competent Body will explain how often it will need test samples of the product. From time to time, the Competent Body may carry out factory inspections and product tests. This ensures that the environmental excellence is maintained for consumers. Documentation should be available at all times.

External audit/certification

The Competent Body may organize a visit or audit to the manufacturing facility.

Also independent verification of test results could be needed, whereby the results must be independently checked by a test laboratory certified as meeting the criteria.

The external audit period depends on product type.

Costs and means

Costs of running the scheme depends on Competent Bodies and from one product to another, fees vary accordingly. Reduced fees are available for SMEs, micro-enterprises and companies from developing countries. A 20% reduction is foreseen for companies registered under EMAS or certified under ISO 14001.

Type of applicants	One-off application fee (€)	Annual fee (€)
Micro-enterprises	200-350	Maximum 350
SMEs and firms from developing countries	200-600	Maximum 750
All other companies	200-1200	Maximum 1500

Internal cost and other external cost must take account.

4.2. Superior Energy Performance Program

Description
SEP is a certification program that provides industrial facilities with a roadmap for achieving continual improvement in energy efficiency while maintaining competitiveness. The program aims to provide a transparent, globally accepted system for verifying energy performance improvements and management practices. It is anticipated that Superior Energy Performance will launch across the US and Canada in 2013.

Logo
There is no Logo associated, though there is a scale – platinum, gold, silver associated.

Origin and history
This standard was developed by the U.S. Council for Energy-Efficient Manufacturing. The U.S. CEEM is a partnership of standards-making bodies, federal agencies, national laboratories, universities, and technical experts. This standard has been developed since around 2007 in the wake of the ISO 50001 stakeholder's meeting. Despite the fact that it is currently a voluntary adoption, the ambition is to makie it compulsory across the US for 2013. The SEP Certified Partners were participants in an initial pilot project funded by the U.S. Department of Energy (DOE) and the Texas State Energy Conservation Office (2010 and 2011). U.S. facilities that earned certification in 2012 participated in subsequent rounds of DOE SEP pilot demonstrations. The SEP Certification of 3M Canada was supported by Natural Resources Canada as part of its participation in the Global Superior Energy Performance initiative.

Objectives
The main goals of Superior Energy Performance are: • Foster an organizational culture of continuous improvement in energy efficiency • Develop a transparent system to validate energy performance improvements and management practices • Create a verified record of energy source fuel savings with potential market value that could be widely recognized both nationally and internationally

Facts and Figures

Five industrial facilities in Texas field tested the Superior Energy Performance from 2008-2010 and became the first facilities certified to the Superior Energy Performance Program. These facilities achieved improvements in energy performance, ranging from 6.5 percent to 17 percent over a period of two to three years.

Platinum Certification Level – 1 participant
Gold Certification Level – 1 participant
Silver Certification Level – 3 participants

Implementation structure

A central element of Superior Energy Performance is the implementation of the ISO 50001, with additional requirements to achieve and document energy performance improvements.
To help facilities prepare for certification, several program elements are available:

- Energy Management Standard, ISO 50001
- SEP Industrial Measurement and Verification Protocol: Methodology to verify energy performance improvement and conformance to ISO 50001 at industrial facilities.
- Certified Practitioners: Professionals certified to assist plants in implementing ISO 50001, conduct system assessments, or verify conformance to SEP requirements for certification.
- System Assessment Standards: ASME standards provide guidance on conducting energy-efficiency assessments in specific energy systems—pumps, process heating, steam, and compressed air.

Requirements & criteria

Facilities that achieve Superior Energy Performance certification obtain ANSI accredited third-party verification for meeting program requirements:

Basic Criteria
- Conformance with ISO 50001 energy management standard and ANSI/MSE 50021 standard
- Measure and verify energy performance improvement using the appropriate sector-specific SEP Measurement and Verification Protocol

Performance Levels
- Energy performance improvement required, minimum requirements set by program
- Two Pathways Available: Energy Performance or Mature Energy

Method of Verifying Result
- Third party verification from an ANSI/ANAB accredited SEP Verification Body

External audit/certification

ANSI/ANAB will be the only accreditation body that can issue accreditation to a Superior Energy Performance Verification Body.

ANSI/ANAB accreditation of Verification Bodies for Superior Energy Performance is not available yet. When available, the accreditation procedure will consist of the following steps:

- Off-site review: ANSI/ANAB will review the candidate Verification Body's documented management system to assure that the design of the management system meets the requirements of MSE 50028.
- Witness audit: ANSI/ANAB will observe the audit team's competence and conformance.
- Office Audit: ANSI/ANAB will assess recordkeeping and competence of the candidate's office personnel.
- Annual surveillance: Once the Verification Body is accredited, ANSI will conduct annual surveillance through office and witness audits.

Costs and means

Information not provided by responsible entity.

4.3. Energy Star – Buildings and Plants

Description
ENERGY STAR is a joint program of the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy to help save money and protect the environment through energy efficient products and practices. EPA's ENERGY STAR partnership offers a proven energy management strategy that helps in measuring current energy performance, setting goals, tracking savings, and rewarding improvements.

Institution in charge
U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy

Scheme link
http://www.energystar.gov/index.cfm?c=business.bus_index

Logo

Origin and history
In 1992 the US Environmental Protection Agency (EPA) introduced ENERGY STAR as a voluntary labelling program designed to identify and promote energy-efficient products to reduce greenhouse gas emissions. Computers and monitors were the first labelled products. Through 1995, EPA expanded the label to additional office equipment products and residential heating and cooling equipment. In 1996, EPA partnered with the US Department of Energy for particular product categories. The ENERGY STAR label is now on major appliances, office equipment, lighting, home electronics, and more. EPA has also extended the label to cover new homes and commercial and industrial buildings.

Objectives

Primarily, to save money and reduce environmental impact from energy usage. This is done through an energy management strategy that helps in measuring current energy performance, setting goals, tracking savings, and rewarding improvements.

Facts and Figures

EPA provides an energy performance rating system which businesses have already used for more than 200,000 buildings across the country. EPA also recognizes top performing buildings with the ENERGY STAR.

It is estimated that the greenhouse gas emissions avoided in the energy savings in 2010 alone was equivalent to those from 33 million cars — whilst saving nearly $18 billion in utility bills.

Implementation structure

ENERGY STAR provides free tools and resources to help measure the energy use of the facility and to compare with other, similar facilities. For many types of commercial buildings, users can enter energy information into EPA's free online tool, Portfolio Manager, and it will calculate a score for the building on a scale of 1-100. Buildings that score a 75 or greater may qualify for the ENERGY STAR. In the industrial sector, plants awarded the ENERGY STAR must score within the top 25 percent of energy efficiency within their industry nationwide, based on a plant energy performance indicator (EPI).

Requirements & criteria

Focusing on the requirements for plants, the plants must be of wet corn milling, auto manufacturing, pharmaceutical manufacturing, cement manufacturing, flat glass manufacturing, container glass manufacturing, juice processing, frozen fried potato processing, pulp and paper manufacturing and cookie and cracker baking plants, or petroleum refining.
The plant must achieve a score of 75 or above with the plant type EPI.
The plant must satisfy the following environmental compliance criteria:

- No High Priority Violations of the Clean Air Act within the past 3 years,
- No significant violations involving on–site generation facilities within the past 3 years,
- No Consent Decree within the last year, and
- No criminal convictions or pleas within the past 5 years or current criminal investigations involving an employee(s) or corporate officers for environmentally–related violations involving air emissions or on–site generation facilities at this plant.
- The plant must have safe lighting levels as recommended by the Illuminating Engineering Society of North America (IESNA).

External audit/certification

Statement of Energy Performance (SEP), which must be signed and stamped by a Professional Engineer certifying that the information used to calculate the plant's energy performance score is correct.

Costs and means

Commercial buildings achieving a score of 75 or higher using Portfolio Manager and verified by a professional engineer or registered architect are eligible to apply for the ENERGY STAR, and thus are subjected to market rates. There is no cost to apply for the ENERGY STAR label.

4.4. Environmental Warrant of Fitness Site Standard

Description
The EWOF is a standard developed to provide recognition for small, single-site businesses, increase the uptake of formal environmental management participation and provide consumers and the community with some reassurance about the site based activities of businesses.

Institution in charge
EWOF Limited

Scheme link
http://www.ewof.co.nz

Logo

Origin and history
New Zeland. Private label scheme.

Objectives
• Provide recognition for small, single-site businesses   • Increase the uptake of formal environmental management participation   • Provide consumers and the community with some reassurance about the site based activities

of businesses

Facts and Figures

Not available.

Implementation structure

Base on EWOF Limited company certification process and external audits.

Requirements & criteria

The EWOF Site Standard comprises of the following sections:

Section 1.0 Management Commitment
Section 2.0 Waste Management
Section 3.0 Water Consumption
Section 4.0 Energy Consumption
Section 5.0 Stormwater Management
Section 6.0 Product Origin
Section 7.0 End-of-life
Section 8.0 Communication with Suppliers
Section 9.0 Consumer Information
Section 10.0 Housekeeping

External audit/certification

Verification to the Site Standard is through:

- Desktop assessment: there are additional quality control measures in place and provision for on-site audits. The easy on-line tool helps you implement the standard then gather and upload your package of evidence. Verification is through a desktop assessment. The process is streamlined and cost-effective.
- Independent referee check.

The EWOF is an annual process and therefore a review must be conducted every 12 months.

10% of reviewed EWOF users will undergo an independent on-site audit annually.

Costs and means

International: $NZD 1237.50 (770 €) annual fee

New Zealand: $NZD 1237.50 *(including $1100 (680 €) annual fee plus $137.50 GST (85 €))*

The annual fee is a one-off all inclusive cost which includes:

- Access to the on-line EWOF standard and guidance information.
- Easy on-line system to upload your evidence.
- Desktop verification of your evidence.
- EWOF certificate and logo for the 12-month period of your approval.
- Listing on the EWOF Community page including your logo, link to your website, and a case study.

Other internal costs must be included.

4.5. WindMade

Description
WindMade is a label identifying organizations and products that use wind power (and other Renewables) in their operations or production. The label allows companies to communicate their commitment to renewable energy, and it provides consumers with the choice to favour companies and products using wind power.

Institution in charge
WindMade

Scheme link
http://www.windmade.org/

Logo

Origin and history
WindMade is incorporated in Belgium as a non-profit association, supported by Vestas Wind Systems, The Global Wind Energy Council (GWEC), WWF, UN Global Compact, The LEGO Group, PwC, and Bloomberg, with the mission to empower citizens to choose products and companies created with renewable energy. A thorough process lies behind the formulation of the standard. The standard was developed in a Technical Advisory Committee comprised of experts from WWF, American Wind Energy Association (AWEA), LEGO, Climate Friendly, Gold Standard and Vestas. The committee was advised by Öko-Institut and PricewaterhouseCoopers, who compiled the verification part of the standard. The standard was also debated in the official Corporate Sounding Board and submitted to an eight-week public consultation period, which provided the Technical Committee with valuable input from key stakeholders.

Finally, the Standard was approved by WindMade's Board of Directors in October 2011.

Objectives

The purpose of WindMade is to increase globally the use of wind power (and other renewables), thereby contributing to the prevention of climate change and to the promotion of resource efficiency and energy security.

WindMade aims to accomplish this purpose by providing companies with the means to demonstrate their commitment to renewable energy and by enabling consumers to make choices which support their own commitments to sustainability.

WindMade is dedicated to increasing corporate investments, especially in wind power by informing consumers about companies' use of wind energy, and increasing demand for products that embrace this clean and renewable energy source.

Facts and Figures

So far, Windmade has not released much information regarding member companies or events.

Implementation structure

1. Join WindMade as a member
2. Choose a 3rd party verifier to verify wind power/ renewables share
3. Receive approval on label use from WindMade
4. Start using the WindMade label

Requirements & criteria

In order to qualify to use the WindMade label a company or organization shall source a minimum of 25% of its electricity consumption from wind energy.

Other renewable energy sources are also accepted and can be communicated as a part of the label. The other renewable energy sources eligible include solar, geothermal, wave, sustainable hydro, sustainable biomass and tidal energy. The right to use the WindMade label is based on the company's certified electricity use for the past year of operations.

External audit/certification

A third party verifier is required to verify wind/ renewable share

Costs and means
Information not provided by responsible entity.

4.6. EKOenergy

Description
EKOenergy is an international ecolabel for electricity based in Finland. The label has started a process leading to a European wide launching in 2013. EKOenergy aims to be more than "green energy": In addition to being 100% renewable it also satisfies additional sustainability criteria.

Institution in charge
EKOenergy

Scheme link
http://www.ekoenergy.org

Logo

Origin and history
The first attempt to create a common European approach for Eco labelling was Eugene Network, which was formally discontinued in 2009. Nevertheless, the development to create a new European ecolabel for electricity started again in 2010. This time the process was driven by the Finnish EKOenergy, which soon found NGO partners in Spain (AccioNatura and Ecoserveis), Italy (100% energia verde), Latvia (LDF) and many other countries. In 2011 RECS International, representing the renewable energy industry gave its helping hand to the new project. RECS International had also considered developing an international green electricity standard but plans remained vague.
The partners started the project 'Creating a renewable electricity standard for Europe' and gradually a common European ecolabel for electricity began to look possible.
Since the summer of 2012 the Finnish Association for Nature Conservation hosts the provisional secretariat of the new European ecolabel. The main task during autumn 2012 was to strengthen the NGO network and to prepare to launch the label in 2013.

Objectives

EKOenergy wants to make use of the market mechanism. It is one of the tools to green the European electricity production. EKOenergy wants to help consumers to choose green electricity, by giving them correct information about the electricity they buy as well as about the meaning of such a purchase.

Facts and Figures

EKOenergy has only just started. Since November 27, the 'Agreement between the Partners of the EKOenergy Network' is open for signature. The agreement is based on the comments received during the consultations and during the public consultation.

So far, 18 environmental NGOs have signed the agreement.

Implementation structure

EKOenergy is inspired by the American Green-e, in the sense that it wants to provide the sector with a widely accepted and recognized certification system.

Interested suppliers need to provide an application as well as provide Guarantees of Origin of generated electricity. A license agreement shall be established with Ekoenergy.

Large consumers (more than 1 GWh) will be able to buy it immediately, everywhere.

Households and others are dependent on what suppliers offer. Negotiations are ongoing to have at least one supplier offering Ekoenergy in each European country.

Requirements & criteria

Anyone can buy EkoEnergy, a 100% renewable electricity; Suppliers must provide Guarantees of Origin, according to the RES Directive (2009/28/EC), defined as "energy from renewable non-fossil sources, namely wind, solar, aerothermal, geothermal, hydrothermal and ocean energy, hydropower, biomass, landfill gas, sewage treatment plant gas and biogases".

The main provisions of Article 15 concerns Guarantees of Origin (GoO):

1. Define and limit the purpose of a GoO
2. Set out the conditions under which they are issued
3. Specify the conditions for using a GoO
4. Set out the conditions for appointing supervisory bodies for national GoO systems
5. Lay down basic ground rules for the supervisory body
6. Specify the content of the GoO

7. Enables GoOs to be used for energy source disclosure
8. Define the impact of purchasing and selling GOs of the supplied energy mix
9. Lay down the conditions under which a Member State may refuse a GoO
10. Provide the Commission with the power to require a member State to recognise a GoO where a reported breach of such conditions has been successfully challenged
11. Enables Member States to define how GoOs are used for the disclosure purposes of the Internal Electricity Markets Directive (2009/72/EC)
12. Enables Member States to require energy suppliers to identify energy from new plant or increased capacity that became operational after 25 June 2009.

External audit/certification

Guarantees of Origin are accepted according to above.

Costs and means

- Costs for Guarantees of Origin (are set by the State's issuing body, and vary between countries.
- A contribution of 18 eurocents per MWh (28 eurocents for hydropower). Of that contribution, 10 cents goes to the EKOenergy Climate fund and 8 cents to the EKOenergy network for the further promotion of renewable electricity.
- Auditing costs (Company has to hire an auditor. In many cases this will be the same auditor who checks other elements, such as the auditor checking the company's accountancy).

4.7. Green e-energy

Description
Voluntary certification program for renewable energy. For over a decade, Green-e Energy has been certifying renewable energy that meets environmental and consumer protection standards that it developed in conjunction with leading environmental, energy and policy organizations. Green-e Energy also requires that sellers of certified renewable energy disclose clear and useful information to potential customers, allowing consumers to make informed choices.

Institution in charge
Center for Resource Solutions

Scheme link
http://www.green-e.org/getcert_re.shtml

Logo

Origin and history
Green-e Climate is a voluntary certification program launched in 2008 that sets consumer-protection and environmental-integrity standards for greenhouse gas (GHG) emission reductions sold in the voluntary market. Green-e Energy is the US's leading independent certification and verification program for renewable energy. Green-e Marketplace is a program that allows companies to display the logo when they have purchased a qualifying amount of renewable energy and passed Green-e verification standards.

Objectives
The Statement of Purpose is to certify environmental commodities and products that mitigate climate change and help build a sustainable energy future.

The mission of the Green-e program and its governing body, the Green-e Governance Board, is to:

1. Bolster customer confidence in the reliability of retail electricity products reflecting renewable energy generation.
2. Expand the retail market for electricity products incorporating renewable energy, including expanding the demand for new renewable energy generation.
3. Provide customers clear information about retail clean energy products to enable them to make informed purchasing decisions.
4. Encourage the deployment of electricity products that minimize air pollution and reduce greenhouse gas emissions.

Facts and Figures

At least nearly 50 organizations have decided to offset their carbon emissions by adopting green-e electricity.

Implementation structure

Green-e is administered by [Center for Resource Solutions](#).

Green-e Energy Standard develops the standards.

Green-e staff also train and accredit the external auditors.

Requirements & criteria

Energy suppliers must:

1. Meet the requirements for renewable resources detailed in the Green-e Energy Standard;
2. Abide by a professional Code of Conduct that governs the marketing and business practices of the participating organizations;
3. Follow the Green-e Energy Customer Disclosure Requirements, including the following:

    a. Provide customer with a Product Content Label for the certified renewable energy option, which identifies the renewable resource type they supply (such as wind or solar) and the geographic location of the renewable energy generator, and
    b. Provide customers with simple, clear Price, Terms and Conditions for the renewable energy option.

4. Undergo an annual verification process audit to ensure that they are buying enough of the right types of renewable energy to match their certified sales to customers;
5. Complete a twice-annual review of marketing materials to ensure the organization is not making false or misleading statements about their certified renewable energy option(s) and is following the Green-e Energy Customer Disclosure Requirements;
6. Pay an annual fee to cover the costs associated with certification.

Organizations using certified renewable energy and wishing to use of the Green-e logo, must:
1. Purchase Green-e Energy Certified renewable energy and/or generate a qualifying amount of

electricity from an eligible on-site generation facility; OR match 100% of the event, vehicle fleet, or facility's carbon emissions with Green-e Climate Certified carbon offsets.

2. Meet all requirements outlined in the Logo Use Agreement and Referenced Documents:
3. Annually attest that the organization has met its eligible renewable energy and/or carbon offset commitment by submitting the appropriate Attestation Form(s). First year program participants must submit their Attestation Form(s) with the Logo Use Agreement.
4. Submit annual Green-e Marketplace fee.

External audit/certification

External auditors are trained by Green-e staff to become accredited.

Costs and means

Publically available on the internet, but generally consists of a standard fee (approximately $4,500) plus a value per MWh of electricity.

4.8. TÜV SÜD Mark EE01/EE02

Description
The TÜV SÜD Mark is to certify electricity generated 100 % from renewable energy sources (EE01) or from 100 % water power (EE02). Requirements for EE01 are: electricity generated 100 % from renewable energy sources; at least 25 % has to be produced in new plants; the energy sources should be identified and clearly indicated. Requirements for EE02 are: electricity generated 100 % from water plants; generation and consumption at the same time; expansion of capacity is optional.

Institution in charge
TÜV SÜD

Scheme link
http://www.tuev-sued.de/plants-buildings-technical-facilities/fields-of-engineering/environmental-engineering/energy-certification/certification-criteria?dtree=1

Logo

Origin and history
The latest revision of this standard dates back to November 2011, and it is the 10th revision.

Objectives
The objective is to certify the generation of electricity as a private-sector guarantee of origin in electricity trading or to serve as a basis for the issue of national, EU-conforming guarantees of origin (GoO).

Facts and Figures

Not revealed.

Implementation structure

TÜV auditors will quantify and verify electricity produced and will emit Certificates of Origin accordingly, often called TRU (TÜV SÜD Renewable Unit, 1 MWh)

Requirements & criteria

The requirements are similar to other GoO, with the following notes:

Definition of ''Energy from renewable sources'': refers to the definition used in German legislation.

If the standard is applied outside Germany in a country with different definitions, a stricter definition of the terms 'energy from renewable sources' will be applied.

TÜV SÜD certification also accepts no sources of energy outside Germany which would not be recognized as renewable in Germany.

Interdiction of double marketing: Amounts of electricity subsidized to strengthen the expansion of energy from renewable sources cannot be certified. Given this, electricity for which feed-in remuneration is paid cannot be certified. Unsubsidized electricity which is sold directly from plants eligible for subsidies can be taken into account.

Investment-subsidized plants can be certified, provided the subsidies do not exceed 15 % of total investment.

External audit/certification

Certification is granted through TÜV SÜD auditors.

Costs and means

Information not provided by responsible entity.

5. National regulation

The national regulations describe firstly the all-embracing European Union Emissions Trading Scheme and then focus on specific regulations of the SUDOE region, namely France, Portugal and Spain.

5.1. European Union

5.1.1. European Union Emissions Trading Scheme (EU-ETS)

Description
The EU emissions trading system (EU ETS) is a part of the European Union's policy to combat climate change, as part of its commitment for the Kyoto Protocol. The EU ETS covers more than 11,000 power stations and industrial plants in 31 countries, as well as airlines.

Institution in charge
European Union

Scheme link
http://ec.europa.eu/clima/policies/ets/index_en.htm

Logo
There is no logo.

Origin and history
The EU-ETS was created by the Directive 2003/87/EC of 13 October 2003 by the European

Parliament and Council.

It follows the Community and its Member States commitment to reduce anthropogenic greenhouse gas emissions under the Kyoto Protocol jointly, in accordance with Decision 2002/358/EC.

It was launched in 2005, and is now in its third phase, running from 2013 to 2020. A major revision approved in 2009 in order to strengthen the system, and the third phase brought the following main changes:

- A single, EU-wide cap on emissions applies in place of the previous system of 27 national caps;
- Auctioning, not free allocation is now the default method for allocating allowances. In 2013 more than 40% of allowances will be auctioned, and this share will rise progressively each year;
- For those allowances still given away for free, harmonised allocation rules apply which are based on ambitious EU-wide benchmarks of emissions performance;
- Some more sectors and gases are included.

Objectives

By putting a price on carbon and thereby giving a financial value to each tonne of emissions saved, the EU ETS has placed climate change on the agenda of company boards and their financial departments across Europe. A sufficiently high carbon price also promotes investment in clean, low-carbon technologies.

The UE-ETS plans that in 2020, emissions from sectors covered by the EU ETS will be 21% lower than in 2005.

Facts and Figures

Operates in the 27 EU countries, the three EEA-EFTA states (Iceland, Liechtenstein and Norway) and Croatia.

Covers around 45% of the EU's greenhouse gas emissions.

Limits emissions from more than 11,000 heavy energy-using installations in power generation and manufacturing industry and flights to and from the EU and the three EEA-EFTA states.

Implementation structure

The EU ETS works on the 'cap and trade' principle. A 'cap', or limit, is set on the total amount of certain greenhouse gases that can be emitted by the factories, power plants and other installations in the system. The cap is reduced over time so that total emissions fall.

Within the cap, companies receive or buy emission allowances which they can trade with one another as needed. They can also buy limited amounts of international credits from emission-saving projects around the world (CDM - Clean Development Mechanisms).

After each year a company must surrender enough allowances to cover all its emissions, otherwise heavy fines are imposed. If a company reduces its emissions, it can keep the spare allowances to cover

its future needs or else sell them to another company that is short of allowances. The flexibility that trading brings ensures that emissions are cut where it costs least to do so.

In allowing companies to buy international credits, the EU ETS also acts as a major driver of investment in clean technologies and low-carbon solutions, particularly in developing countries.

Requirements & criteria

The EU-ETS covers the following greenhouse gases and sectors:

- Carbon dioxide from Power and heat generation, energy-intensive industry sectors including oil refineries, steel works and production of iron, aluminium, metals, cement, lime, glass, ceramics, pulp, paper, cardboard, acids and bulk organic chemicals, and commercial aviation;
- Nitrous oxide from production of nitric, adipic, glyoxal and glyoxlic acids;
- Perfluorocarbons (PFCs) from aluminium production.

External audit/certification

EU governments are responsible for the verifications of national emissions.

Costs and means

Costs can be highly variable, and it is actually possible to generate profit. It depends on Carbon prices, which have been highly volatile.

5.2. France

5.2.1. Energy certification: Grenelle II (White Certificates)

Description
Grenelle II is not a formal detailed legislation, but the current French framework for energy and environmental efficiency. There is no compulsory legislation for the Industry, but despite that, Public Buildings (State Owned) and Tertiary Buildings subjected to rent or sale should be certificated and therefore subjected to a technical (energy) audit. Hence, this present analysis covers the most relevant and innovative approach from the Grenelle framework, which is the emission of White Certificates that relate to Energy Efficiency.

Institution in charge
French Government

Scheme link
http://www.developpement-durable.gouv.fr/-Certificats-d-economies-d-energie,188-.html

Logo
There isn't a specific logo associated with Grenelle or White Certificates

Origin and history
White Certificates are currently being applied in the United Kingdom, Denmark, Italy, Ireland and France. Other European countries, such as Poland, are currently studying their compulsory implementation. In France, the White Certificates System (Certificats d'Économie d'Énergie - CEE or "certificats blancs") were created with the general Energy Strategy Law, from 13 July 2005 that establishes French strategic orientations for Energy (articles 14, 15, 16, et 17). The White Certificates System works in 3 year periods: from mid-2006 to mid-2009, from mid-2009

to the end of 2010 and from the beginning of 2011 to the end of 2013.

According to ADEME, by the end of February 2008, 220 CEE where emitted to 58 benefiting entities with a volume of 14 TWh cumac (cumulé et actualizé, that is, covering the life cycle of the equipment) which meets 26% of the final objective of the White Certificates Scheme. These savings relate specially to the residential sector amounting to nearly 95%, of which 75% are economies in heating systems and 20% in thermal insulation.

Objectives

The CEE aims to implement energy efficiency measures which are "additional", that is, that weren't to be considered business as usual, or compulsorily implemented through specific legislation.

The CEE unit is the kWh cumac, final energy, cumulated and actualized during the product lifecycle. Actualized, means it takes into consideration the market penetration of the product in a business as usual scenario, hence it is generally accepted a "discount rate" of around 4%.

The first period objective (1st July 2006 to 30th June 2009) was 54 TWh cumac.

The objective for the period 2011-2013 is 345 TWh cumac, where 255 TWh cumac are supposed to be delivered from Utility Companies (Electricity, Gas, Domestic Fuel, GPL and District Heating and Cooling) and 90 TWh cumac are supposed to be delivered by suppliers of vehicle's fuel.

Facts and Figures

Companies that are obliged to buy CEE must meet their appointed targets, otherwise pay a penalty of 0,02 €/ kWh cumac.

Although UK studies point to an average price of 0,01 €/ kWh cumac, average prices in the first period were as low as 0,003 €/kWh.

In the first trimester of 2011, CEE were being traded at an average price of 0,0035 to 0,0037 €/ kWh/ cumac.

Implementation structure

Utility Companies (Electricity, Gas, Domestic Fuel, GPL and District Heating and Cooling) as well as suppliers of vehicle's fuel with sales above a certain limit are obliged to buy White Certificates.

These same companies, as well as Public Entities (Collectivités Publiques) and the "National Housing Agency", responsible for social housing, have the right to emit White Certificates, therefore benefitting from an extra income for their energy efficiency measures.

To limit the bureaucracy, only projects above 20 GWh cumac are accepted, therefore promoting the association of different entities to the common goal of emitting CEE.

Operations can be considered "standard" if they follow a list of pre-determined measures with pré-calculated (average) savings (see http://www.developpement-durable.gouv.fr/1-le-secteur-du-

<u>batiment</u>).

Operations can be specific, if energy efficiency specialised company provides an audit and technically sound (predicted) energy savings.

Requirements & criteria
See above.

External audit/certification
Control operations are the responsibility of the "Pôle National des Certificats d'Économies d'Énergie", (PNCEE), part of the General Directorate for Energy and Climate, under the Ministry of Ecology, Sustainable Development and Energy.

Costs and means
There are no direct costs with the program, though it may be expected to hire consultants subjected to market rates.

5.2.2. Energy building certification

Energy certification is only available for new buildings, buildings for sale and public buildings.

5.3. Portugal

5.3.1. SCE – Energy building certification

Description
The National Certification building Energy Systems and Air Quality (SCE) is the Portuguese energy mandatory certification imposed by the transposition of the EU Directive 2002/91/CE. The SCE includes two regulation documents: RCCTE: building thermal characteristic behaviour regulation DL *78/2006.* RSECE: energy systems and air quality regulation DL *79/2006*. The regulation includes new and old building, domestic and service buildings.

Institution in charge
ADENE – National Agency for Energy

Scheme link
http://www.adene.pt/pt-PT/Subportais/SCE/Paginas/default.aspx

Logo
Certificação Energética e Ar Interior EDIFÍCIOS

Origin and history
The Energy sector is responsible for almost 40% of the final energy in Portugal. Before 1990 there were no building energy requirements. First regulation was publishing in 1990 and 1998, but was ineffective.

After the 2002/91/CE directive (EPBD), new version of the regulations was published in 2006:

SCE - Dec. Lei 78/2006
RSECE - Dec. Lei 79/2006
RCCTE - Dec. Lei 80/2006

Objectives

Based on the EPBD, national regulation key objectives are:

- establish a methodology for calculating the integrated energy performance of buildings;
- minimum standards on the energy performance of new buildings and existing buildings that are subject to major renovation;
- systems for the energy certification of new and existing buildings.
- Periodic inspection of boilers and central air-conditioning systems in buildings.

Implementation structure

Supervisory organizations: Direcção Geral de Energia e Geologia (DGEG), Agência Portuguesa do Ambiente (APA).

Managing organization: Agência para a Energia (ADENE).

Certification entities: individual qualified experts, responsible for conducting the process of building certification.

Qualified Experts recognition: Ordem dos Arquitectos (OA), Ordem dos Engenheiros (OE) and Ordem dos Engenheiros Técnicos (ONET).

Responsible for compliance: promoters and building owners.

Qualified Experts inspection entity: ADENE.

Requirements & criteria

The RCCTE include residential buildings, small service buildings up 25 kW HVAC (heating, ventilation, and air conditioning) power installed. The main requirements for new buildings energy certification are:

- Energy requirements, including maximum heat transfer coefficients allowable, maximum permissible solar factor of glazing and limit values for nominal useful energy needs (heating, cooling, hot water) and primary energy;
- Mandatory use of solar collectors for DHW production;
- Minimum of 0.6 renewals of fresh air per hour.

For existing buildings a simplified methodology is applied.

The RSECE include service buildings, buildings with more than 1000 m^2 or more than 25 kW HVAC

power installed. The main requirements for new buildings energy and air quality certification are:

- Energy requirements, including limiting the nominal specific energy consumption;
- Requirements for design of new HVAC systems;
- Requirements for construction, testing and maintenance of facilities;
- Requirements for maintaining Indoor Air Quality;
- SCE requirements, including the posting of a copy of the valid certificate in an accessible and visible position at the entrance.

External audit/certification

For energy certification an external audit/study is required, conducted by an independent external qualified expert, accredit by ADENE and professional orders.

The certification on RCCTE base is valid for 10 years.

The certification on RSECE base is valid for 2, 3 or 6 years for buildings or portions of buildings subject to periodic audits of energy or indoor air quality.

Facts and Figures

In December 2012, more than 561.000 buildings were certificated since 2006.

New buildings are predominantly A, B and B- class.

Existent buildings are predominantly C class.

Costs and means

Costs will depend on building type, but some statistical data point to the next costs for audit and certification expertise:

Domestic 1-2 €/m2 of useful building area
Services: 2-4 €/m2 of useful building area

Fixed fee for obtaining the certification approval (ADENE fees):

Domestic: 45 €
Services: 250 €

5.3.2. Sistema de Gestão dos Consumos Intensivos de Energia (SGCIE)

Description
SGCIE is the Portuguese code for large energy consumers (above 500 tonnes of oil equivalent per year). It covers both industrial sites and very large buildings that reach this energy consumption threshold.

Institution in charge
ADENE – National Agency for Energy

Scheme link
http://www.adene.pt/pt-pt/SubPortais/SGCIE/Paginas/Homepage.aspx

Logo

Origin and history
The SGCIE code is based on the Portuguese Law, Decreto-Lei 71/2008. It adapts to the Portuguese Legislation, the EU Directive 2006/32/CE, and supersedes the former Regulamento de Gestão do Consumo de Energia, that dates back from Decreto-Lei 58/82.

Objectives
The main objectives are: • Promote energy efficiency   • Monitor Energy Consumption of energy intensive installations

Facts and Figures

In December 2012, nearly 1000 installations were covered by this Code, totalling nearly 1.4 Mtoe per year (please note that nearly 2.4 Mtoe are currently covered by the EU-ETS. It is predicted that these industries will move to the SGCIE in the next years).

Implementation structure

The SGCIE covers an energy audit that leads to an energy reduction commitment. That energy reduction commitment is monitored regularly until the end of a 4 or 6 year period. Then a new audit is done, and the cycle repeats itself.

Requirements & criteria

All sites with an annual consumption above 500 toes are covered by this code. Sites with consumption above 1000 toes are subjected to more strict and demanding energy commitments.

External audit/certification

The General Directorate for Energy (DGGE) is responsible for authorizing the site's commitment for energy reduction. ADENE, the Agency for Energy will subcontract non accredited auditors for random verification of energy audit reports, reduction plans, and monitoring reports.

Costs and means

The taxes paid refer to the authorization for the reduction plan/ commitment, and it consists in €350 for sites below the 1000 toes, and €750 for sites above 1000 toe. Companies shall also hire accredited auditors for doing the energy audit, the reduction plan, and the monitoring of the implementation plan, with variable fees, according to the market.

5.4. Spain

5.4.1. DL47/2007 Energy building certification

Description
The transposition of the EU Directive 2002/91/CE, was partially made by the Real Decreto 47/2007. Two others legislations are in force: Real Decreto 314/2006 approving the Technical Building Code (CTE) and the Real Decreto 1826/2009, approving Thermal Building Regulation (RITE). Only new buildings are involved. New legislation for existing buildings awaits publication.

Institution in charge
IDAE - Instituto para la Diversificación y Ahorro de la Energía

Scheme link
http://www.idae.es/index.php/id.25/mod.pags/mem.detalle

Logo
No logo applicable.

Origin and history
The first regulation including energy savings was the Technical Building Code (NBE-CT-79) (1979) and the first version of the Thermal Building Regulation (RITE) in 1998. The new EU directive EPBD forced new regulation, and both standards were reviewed in 2006, 2007 and 2009, publishing the new CTE and RITE.

Objectives

The main objectives of the RD 47/2007 are to:

- Establish the basic procedure for certification of energy efficiency of new buildings.
- Create a register for technical documents recognized for certification of energy efficiency.

Implementation structure

Implementation responsibility: Ministry of Industry, Tourism and Commerce and Ministry of Housing.

Supervisory organization: IDAE

Managing, certification and quality control organization: Autonomous Communities.

Qualified Experts: for project and finished building certification it is only necessary to have qualifying degree according to Law.

Responsible for compliance: promoters and building owners.

Requirements & criteria

Legal requirements are establish on RD47/2007.

Technical requirements are provide by the CTE, in the Saving Energy Basic Document (DB-HE), with requirement for:

- Energy demand limitation of (HE-1)
- Performance of thermal installations (HE-2
- Energy efficiency of lighting installations (HE-3)
- Contribution minimum solar hot water (HE-4)
- Contribution Minimum PV Electric (HE-5)

For HVAC and solar installation the RITE also provide several designs, construction and maintenance requirements.

External audit/certification

Autonomous Communities can count on authorized agents, which may be accredited bodies, organizations for the building regulatory field or qualified independent technicians. Each Autonomous Community can establish the process and requirements for these building quality control bodies.

Facts and Figures

Not available.

Costs and means
The certification costs are established by the market, and include designer and building project management for new buildings. There is a set fee to obtain the certification, but approval depends on the Autonomous Communities and fees can be variable: Domestic: 20-150 € Services: 20-1200 €

5.4.2. Energy Industry certification

Not mandatory or regulated.

6. Industrial certification – a roadmap

Broadly speaking, in terms of end results, the labels and certifications schemes analysed can fall into three classes:

- Energy/ Carbon offsetting
- Environmental Certification Schemes
- Energy Certification Schemes

For the first class, Energy/Carbon offsetting, the main objective is not directly to manage and reduce energy use, but simply to compensate the companies' energy use with Carbon Credits/Green Energy or White Certificates. Examples of these labels are WindMade, EkoEnergy, GreenEnergy or even the White Certificates Scheme. Although the EU-ETS philosophy is similar, due to determined specifics of this particular scheme, a great emphasis in energy management and efficiency is sought.

The second class, Environmental Certification Schemes, do try to address energy efficiency and energy management, though they are strictly integrated with other environmental issues, thus energy relevance tends to be more modest. Examples are the ISO14001, EMAS, EU Ecolabel or the Environmental Warrant of Fitness Site Standard.

Finally, the third class, Energy Certification Schemes, clearly addresses energy management and efficiency, and therefore, these schemes appears to be more relevant for an integrated approach for energy that includes policy, management, energy efficiency, and eventually on-site generation. Examples are the ISO50001, Energy Star, Superior Energy Performance Scheme, and even the scheme adopted in Portuguese Legislation for large scale energy users, SGCIE.

6.1. Overview

According to the hierarchy of energy (Figure 2), the first priority for any energy strategy shall always be the efficient use of energy, and only when all technically and economically viable measures have been taken, shall efficient energy generation be addressed (either by renewables or through cogeneration).
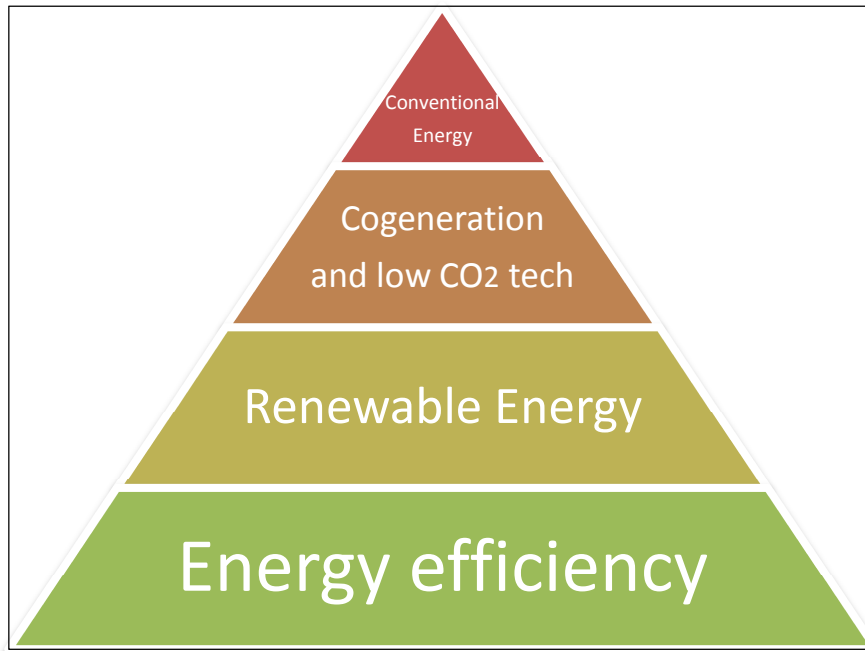
FIGURE 2 – ENERGY HIERARCHY

The success of French White Certificates in addressing energy savings with reduced capital costs, are a clear example that economics tend to favour energy efficiency.

This emphasis in Energy Efficiency is particularly notable in the US labels Energy Star and Superior Energy Performance. Both these labels and the Portuguese SGCIE also address the need of managing and monitoring Energy use. The first two labels are voluntary labels that demand the implementation of an ISO 50001 energy management system, while the latter, by providing compulsory legislation for installations with intensive energy use with obligations to communicate details of their energy usage. These obligations in addressing Energy Management are fundamental since Energy Management is critical in any sound strategic approach for Energy, as Energy Management by itself, is always only a cost, without any direct saving.

The ISO 50001 is central for any energy management system. There may not be the need to formally obtain the label, but the framework it carries provides all the tools for a successful energy management system.

The other Energy labels addressed in this report may be considered as some sort of Commercial Labels aiming to prove a companies' commitment to Low Carbon energy use, usually by providing variants of renewable generated energy certificates of origin to displace energy use.

None of these labels addresses cogeneration as a low carbon technology.

6.2. Energy Performance – benchmarking

While energy performance is benchmarked in terms of energy intensity for the Superior Energy Program, Energy Star, and PT-SGCIE, the other labels address absolute energy consumptions. Since absolute industrial energy consumption is mostly related to production levels, and productions levels are dependant of the economic level of the company, these tend to suffer strong variations with time. There are relatively frequent decreases or huge rises in energy consumption, simply due to oscillations in the production. This is why the energy indicator preferred by the Industry is always the Energy Intensity. On the other hand, the variety of manufactured products, along with the different technologies involved in their production is immense, and it is nearly impossible to benchmark all Industries.

It may be considered that while absolute energy use is not the best indicator for the Industry, the compatibility it provides with existing tools for Low Carbon Energy verification (White Certificates, Green Certificates, Certificates of Origin, etc.) makes it perhaps the most appealing and easy to implement and easy to communicate with the general public. This is particularly visible in a label such as WindMade that shows clearly that a company/ product uses a percentage of its energy from renewable sources.

6.3.   Way Forward – the Energy Certification Scheme Roadmap

While the mechanics and details may vary between each Energy Certification Scheme, the basic principles are mostly similar. They tend to value particularly the energy management system, since that is the core for any energy reduction plan. Typically the following steps lead to the certification:

1. **Get full commitment from Director's Board**: this is absolutely essential since energy use tends to be transversal to several areas. Only top commitment will allow cross-sector measures and activities.
2. **Establish a comprehensive Energy Policy**, agreed with the Director's Board, and covering the finance of energy measures, internal and external communication, defining an Energy Manager (part-time or full time), and ideally, establishing well defined objectives.
3. **Invest on internal communication channels**: energy efficiency will depend on the top director, as well as maintenance engineers and end users, such as security staff and cleaning personnel.
4. **Perform an Energy Diagnostic**: The objective is not so much to determine exact energy efficiency measures, but more to understand energy usage, in order to establish priorities and monitoring strategies.
5. **Implement an Energy Management System:** including sub-monitoring of main energy uses.
6. **Consider performing detailed energy audits**: to specific systems instead of broader energy audits. Assuming enough information has been gathered from sub-monitoring systems, energy efficiency measures can be presented to the Director's Board with a greater level of confidence.
7. **Consider the best certification scheme for the plant**, and choose the best timing to implement it. If all these steps were taken, obtaining the certification scheme will be more of a formality than an absolutely new challenge.
8. **Continuous improvement:** check the results of the energy management system periodically and identify improvement opportunities.

7. Conclusions

The present study covers the state-of-the-art of a wide range of environmental and energy labels, as well as Energy Legislation at national and EU level. It identifies three classes of Certification/ Schemes and labels:

- Energy/ Carbon offsetting
- Environmental Certification Schemes
- Energy Certification Schemes

It was considered that Energy Certification Schemes such as ISO50001 are more relevant for the present study. It was equally found that the globally recognized standard, ISO 50001, is central for Energy Management and Energy Efficiency. This standard not only sets and energy policy with management level support, but also sets internal procedures for energy planning, verification and monitoring. It formally implies the company's acceptance of National/ European – compulsory legislation.

Although different Energy Certification Schemes will have different procedures to obtain them, the basic steps for implementing an Energy Management system are central to all.

It was also found that despite the plethora of Energy labels, there is no label in Europe that integrates Energy Management, Energy Efficiency and Renewable Energy, like there is in the US, with labels such as Energy Star or Superior Energy Performance.

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