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# Does ISO 14001 work in Brazil?

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ABSTRACT

As a result of increasing global awareness about the importance of the environment, depletion of natural resources and legal pressures for companies to manage their processes in a sustainable manner, ISO 14001 systems have been gaining increasingly more importance in the organizational scenario. These elements are even more critical in emerging nations due to less awareness and fewer demands by governments and the population in relation to environmental issues. Therefore, the main objective of this study is to verify the benefits and difficulties of Environmental Management Systems based on ISO 14001 at industries in the state of São Paulo – Brazil (an emerging country) by conducting a survey to subsidize the proposal for actions in the public, academic and private sectors to promote the use of this standard of reference and strengthen its results in Brazil. A questionnaire was sent to 194 companies from the National Institute of Metrology, Standardization and Industrial Quality database. 69 answered, representing a return rate of 35.36%. The main benefits identified are related to the development of preventive environmental actions, reduction in the consumption of power, water, gas and fuel oil, and a positive influence on other internal management processes. The main difficulties are related to cost increases from ISO 14001 management systems and the constant changes in environmental legislation in Brazil. Some actions are proposed at the end of the analyses to intensify the use and improve the results of this standard, such as changes in government legislation and its collective development and implementation in industries.



## 1. Introduction

Increased global competition has forced organizations to constantly update in order to differentiate themselves technically as well as managerially from their competitors and thus remain competitive in the current uncertain and competitive scenario (Radonjic and Tominc, 2006).

Although each company's main objective is profit, environmental issues have become increasingly more important as a result of the increase in consumer awareness and the growing interest in how products and services are produced, used and disposed of and how they affect the environment; the demand for large organizations-partnerships to use cleaner production practices and to have internationally recognized certifications; increasingly scarce natural resources and the companies' high pollution indexes, especially in Brazil, where they have only been required to improve environmental performance over the past few decades (Delmas, 2001).

The industrial sector is one of the most responsible for increases in pollution as a result of production process characteristics and the wrong way some consumers use products during their useful lives, for example, an automobile without proper maintenance (Bellas and Nentl, 2007). Within this context, certifiable environmental management systems based on ISO 14001 emerge as an important alternative to improve this situation in relation to environmental management in an industrial setting. These systems are being adopted at ever increasing rates by managers from around the world in order to solve the most diverse environmental issues: avoid environmental impacts, improved use of natural resources, workforce awareness, process standardization and compliance with legislation, etc. (Gavronski et al., 2008).

ISO 14001 stipulates requirements for managing environmental management systems (EMS) without defining how or to what extent to do so, thus permitting companies to develop their own solutions for complying with the norm's demands. This gives it a universal nature since it can then be adapted by companies in any region and regardless of size (Corbett and Kirsch, 2001).

There is still a lack of scientific studies that discuss the benefits and difficulties of ISO 14001 certification in quantitative terms, thus revealing the need and importance of studies such as this one (Babakri et al., 2004; Melnyk et al., 2003). Furthermore, a quantitative study to

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effectively verify the benefits and difficulties in using ISO 14001 systems permits the proposal of actions in public, private and academic sectors, based on a broader and more current panorama, to increase the use of this standard and improve results from its use. It also permits corroborating, deepening or correcting the theoretical reference from these field verifications.

This study's geographical borders are delimited by the most important Brazilian state from an economic perspective: São Paulo. Brazil has twenty-six states and a federal district. It has a population of 183,987,291 inhabitants (census data from 2007). In the second quarter of 2008, its Gross Domestic Product (GDP) was approximately 358 billion dollars. The state of São Paulo has 645 cities, a population of approximately 39,827,570 inhabitants and it is responsible for 31% of Brazil's GDP (IBGE, 2009).

Despite all the environmental problems Brazil is going through, it had 2447 ISO 14001 certificates in 2008 and São Paulo had 652 of them, representing 26.65% of the national total. However, the net number of São Paulo companies with ISO 14001 certification at the time this study was conducted (second semester of 2008) was 194, already discounting certifications based on older versions of the norm and the case of different certifications at different business units of a same company (INMETRO, 2009).

As a result, the main objective of this study is to verify benefits and difficulties in adopting ISO 14001 EMS at industries in the state of São Paulo by conducting a survey to subsidize the proposal for actions in public, academic and private sectors to promote the use of this standard of reference and strengthen its results in Brazil.

## 2. A review of EMS and ISO 14001

### 2.1. Environmental management systems

Projects that preserve the environment have become more promising and should reverse decades of environmental negligence. Modifications in processes that can cause environmental impacts are being introduced in industries little by little, especially in emerging countries, and they are even applied in product development. Practically every element in the production chain – raw material producers, manufacturers and clients/users – can benefit from green engineering (Oliveira and Pinheiro, 2009).

The private sector, especially the industrial segment, has advanced in its treatment of environmental problems and today they can be seen as an opportunity to increase competitiveness starting with environmentally responsible management, contrary to previous thought (González et al., 2008).

Social factors (constant changes in consumer demands and nongovernmental entity actions) and economic/political factors (restrictions and fines and new legislation) exert additional pressure for introducing environmental management at companies (Oliveira and Pinheiro, 2009).

An environmental management system can be described as a methodology through which organizations operate in a structured manner in order to ensure protection of the environment. They define the impacts of their activities and then propose actions to reduce them. Therefore, an EMS' objective is to control and continuously reduce these impacts (Rowland-Jones and Cresser, 2005).

An EMS is part of the organizational management system used to design, implement and manage environmental policy. It includes interdependent elements, such as organization structure, sharing of responsibilities and planning of practices, procedures and resources needed to determine and achieve the referred to policy and its objectives (Melnyk et al., 2002; Fortunski, 2008).

Besides social responsibility and the creation of conditions to comply with legislation in effect, these systems permit identifying opportunities to reduce material and energy consumption, as well as improve process efficiency (Chan and Wong, 2006).

Many environmental tools seem to only focus on a single aspect of the product's life cycle, but they may be used to mitigate environmental impacts in every phase. For such, it is necessary for environmental administration to be conducted according to a well-structured EMS (Reyes and Wright, 2001).

Implementation of an EMS permits continuous reassessment of the production process, searching for procedures, mechanisms and behavior standards that are less harmful to the environment (Perotto et al., 2009).

Environmental protection tied to an EMS can occur as an improvement (cleaner technology) or radical innovation (clean technology). The improvement affects different dimensions, such as material intensity (efficient use of materials), energy intensity (efficient use of energy), transport intensity (efficient logistics), surface intensity (efficient use of space) or risk intensity (related to factory floor plan, substances and products). Innovation, on the other hand, is related to the development of new technology that can improve some or all product life cycle phases (Jänicke, 2008).

For an EMS to be effectively useful for company development and to manage sustainable development, it is necessary to incorporate objectives, planning and activities and specific metrics, which are commonly found in an ISO 14001 based system (ISO 14001, 2004; Robert et al., 2002).

However, despite the ISO 14001 EMS to be the standard most adopted worldwide, there are other references also widely used, such as EMAS (The EU Eco-Management and Audit Scheme), Cleaner Production and Life Cycle Analysis, briefly described next. The EU Eco-Management and Audit Scheme (EMAS) is a management tool for companies and other organizations to evaluate, report and improve their environmental performance (González et al., 2008). The scheme has been available for participation by companies since 1995 and was originally restricted to companies in industrial sectors (EMAS, 2010). Since 2001 EMAS has been open to all economic sectors including public and private services, but it is not often used in Brazil. Cleaner Production is a model that aims to produce products in a sustainable manner, using materials and energy efficiently, prioritizing inputs non-harmful to human health and conserving biodiversity trough the questioning how the products are produced and how it is possible to improve it in order to interfere less in the environment (Rao, 2004; Bonilla et al., 2010). Life Cycle Analysis is a tool for the quantification and analysis of emissions and environmental impact of a product, process or system since extraction of raw materials until its disposal in the environment, through all the intermediate stages (manufacturing, transport and use) (Ometto and Roma, 2010; Robert, 2000; Glavič and Lukman, 2007; Finnveden and Moberg, 2005). These systems are complex and larger than ISO 14001 scope and do not serve the objective of this research.

### 2.2. ISO 14001 system

The ISO 14001 standard is designed to provide an internationally recognized framework for environmental management, measurement, evaluation and auditing. It does not prescribe environmental performance targets, but rather provides organizations with the tools to assess and control the environmental impact of their activities, products or services. The standard addresses the following principles: environmental auditing, environmental labelling and declarations, environmental performance evaluation, as well as approaches: environmental management and life cycle assessment (Robert, 2000; Glavič and Lukman, 2007).

In Brazil, the number of companies that have elaborated environmental management based on ISO 14001 has increased